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# Improved Urban Food Distribution Facilities for Denver, Colorado

Marketing Research Report No. 909

Agricultural Research Service

UNITED STATES DEPARTMENT OF AGRICULTURE



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## Acknowledgments

Appreciation is extended to the wholesale firms in Denver who furnished the data upon which this study is based. The Office of the Mayor, the Denver Chamber of Commerce, and the Colorado State University cooperated on the study.

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# Improved Urban Food Distribution Facilities for Denver, Colorado

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## SUMMARY

This study was conducted to assist local authorities and the Denver food industry in planning new wholesale food distribution facilities to replace those that are outmoded and inefficient or located in areas scheduled for redevelopment.

In 1966, 104 independent wholesalers of fresh fruits and vegetables; groceries; meat and meat products; butter, margarine, cheese, and eggs; poultry; and frozen foods and fishery products received about 347,800 tons of food. This amount was over 31 percent of the total 1,104,300 tons received in Denver during that year. Five full-line chains with warehouse facilities in the metropolitan area received the remaining 68 percent, or 756,500 tons.

An analysis of present food marketing facilities and costs in the metropolitan Denver area indicated that 65 of the 104 independent wholesalers could benefit by having new facilities. Operating in an efficient, modern food distribution center, they could save an estimated

\$100,000 annually in food marketing costs.

Plans for such a center include six multiple-occupancy buildings, six single-occupancy buildings and one refrigerated warehouse. Space for future expansion and for parking about 600 vehicles is also included.

The proposed facilities require a site of about 57 acres. Land in the stockyards area can provide this acreage. An additional 25 acres, adjacent to this site, could provide space for allied industries.

The total cost of land and facilities is estimated to be \$10.1 million. If privately financed, the average annual rental cost would be about \$2.65 per square foot, which represents a substantial increase in rent for most firms. The higher rental cost may be partly offset, however, through more efficient operations resulting from better handling methods and product flow, improved layout design, proper platforms for loading and unloading, and generally improved working conditions.

## BACKGROUND

Several food firms in Denver are located in an area scheduled for redevelopment and must

relocate. Other firms in other sections of the city are operating in facilities that are outmoded. Food industry leaders together with various local and State government officials requested the U.S. Department of Agriculture

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<sup>1</sup> Thomas J. Seabold was formerly with the Transportation and Facilities Research Division, Agricultural Research Service.

for help in making a study to plan new and improved wholesale food distribution facilities in Denver. The study began in 1967 and had the following objectives:

- To determine the adequacy of present food marketing facilities in Metropolitan Denver.
- To estimate the major costs of handling food products through existing facilities.
- To develop plans for new facilities that would meet present and future needs of food firms.
- To estimate costs of facility construction, probable operating expenses, and rental requirements.

- To estimate probable savings and other benefits from adopting suggested improvements.

This report presents the findings and recommendations from that study.

Data in this report were obtained with the assistance of the Denver Chamber of Commerce, the Denver Planning Office, the Urban Renewal Authority, local government agencies, and civic, trade, and labor groups.

Data relating to volume of commodities, handling, and other costs are for calendar year 1966 unless otherwise designated. Most figures are rounded to whole numbers in the text; exact figures appear in the tables.

## FOOD MARKETING IN DENVER

Denver, the capital of Colorado, is located on the eastern edge of the Rocky Mountains and is the State's leading manufacturing and commerce center. The Standard Metropolitan Statistical Area (SMSA) contains approximately 4,500 square miles and encompasses six counties: Adams, Arapahoe, Boulder, Denver, Douglas, and Jefferson.

The metropolitan area is served by several main highways and expressways including Interstate Highways I-25 and I-70. It is also served by six major railroads: The Atchison, Topeka, and Santa Fe; the Chicago, Burlington, and Quincy; the Colorado and Southern; the Chicago, Rock Island, and Pacific; and

Denver and Rio Grande Western; and the Union Pacific System. Air freight service is provided at the city's municipally owned Stapleton International Airport.

Between 1950 and 1967, the population of Metropolitan Denver increased from 616,000 to 1,128,000, representing a gain of over 83 percent. Current projections indicate that the population will rise to 1.6 million by 1980. If realized, this increase will have a profound impact upon the volume of food that will be received and handled in Denver. Further, by 1980, the State's tourism industry will undoubtedly be greater, adding to the volume of food that will be required.

## NUMBER OF FOOD FIRMS AND VOLUME HANDLED

In this study 104 independent food firms are included. They are classified into the following groups: (1) Fresh fruits and vegetables; (2) groceries; (3) meat and meat products; (4) butter, margarine, cheese, and eggs; (5) poultry; and (6) frozen foods and fishery products. In addition, five food chains that have warehouse facilities within Denver are included, but they are classified separately from the independent food firms. Firms that conducted minor wholesaling activities but were primarily retailers and firms that operated as brokers are not included. Independent firms are classi-

fied according to the major food commodity handled.

The total volume of direct receipts handled was 1,104,327 tons (table 1). This figure includes the volume received by the five food chains. No further data on chain operations are presented in this report because these chains had relatively good warehousing facilities.

The analyses and determinations are based on data from independent food firms only. These firms received an estimated 347,766 tons of food products. Of this amount, 284,142 tons came by truck, 63,185 tons, by rail (including piggyback shipments), and 439 tons by air.

TABLE 1.—*Number of food firms and estimated volume of direct receipts, by method of transportation, Denver, 1966*

Type of food firm	Firms	Volume of direct receipts			
		Truck	Rail <sup>1</sup>	Air	Total
Independent dealers:	<i>Number</i>	<i>Tons</i>	<i>Tons</i>	<i>Tons</i>	<i>Tons</i>
Fresh fruits and vegetables -----	36	108,037	24,362	1	132,400
Groceries -----	17	51,444	30,916	82	82,442
Meat and meat products -----	32	72,780	1,641	149	74,570
Butter, margarine, cheese, and eggs -----	9	19,632	6,200	---	25,832
Poultry -----	6	21,604	---	---	21,604
Frozen foods and fishery products -----	4	10,645	66	207	10,918
Total independent -----	104	284,142	63,185	439	347,766
Food chains <sup>2</sup> (all commodities) --	5	452,061	303,895	605	756,561
GRAND TOTAL -----	109	736,203	367,080	1,044	1,104,327

<sup>1</sup> Includes deliveries made from team tracks and piggyback shipments.

<sup>2</sup> Includes only those with warehousing facilities in Denver.

## PRESENT FACILITIES

Almost half of the independent food firms were concentrated in three main areas: (1) the Market Street Market; (2) the Wazee Market; and (3) the Denargo Market. The other independent food firms were scattered throughout the metropolitan area. Figure 1 shows their locations as well as the locations of chain and public refrigerated warehouses.

In the Market Street area, 16 dealers handled about 49,400 tons of food, or 14 percent of the total volume received by all independents in 1966. At the Wazee Market, 6 dealers received 17,843 tons, or 5 percent of the total volume. The Denargo Market with 28 dealers handled about 109,174 tons, almost 32 percent of the total. The remaining 171,349 tons, or 49 percent, was received by the 54 dealers scattered throughout the metropolitan area.

### Market Street Market

The Market Street Market was an established food wholesaling area in the early 1900's. The firms located there were mostly meat wholesalers, but later wholesalers of produce; butter, margarine, cheese, and eggs; dry groceries; poultry; and fishery products began

moving to the market. As the area developed, nonfood firms also located there and the number of these firms increased significantly as time passed.

Many produce dealers left Market Street after the Wazee and Denargo markets were constructed in 1939, and since the late 1940's the total number of food firms in the Market Street area has steadily declined. Today, 16 wholesale food dealers and a public refrigerated warehouse remain. Most of the other buildings in the area are used mainly as general warehouses for various nonfood concerns.

The Market Street area is bordered on the northeast by 20th Street; on the southeast, by Market Street; on the southwest, by 14th Street; and on the northwest, by Wynkoop Street. The facilities occupied by food dealers are old and antiquated. The buildings, designed for warehousing methods of 60 years ago, have not been changed materially and create difficulties in trying to use modern work methods and equipment. Stairways are often inconveniently located; freight elevators are slow; and building support columns are located so as to prevent interior facility improvements. These and other conditions have made good

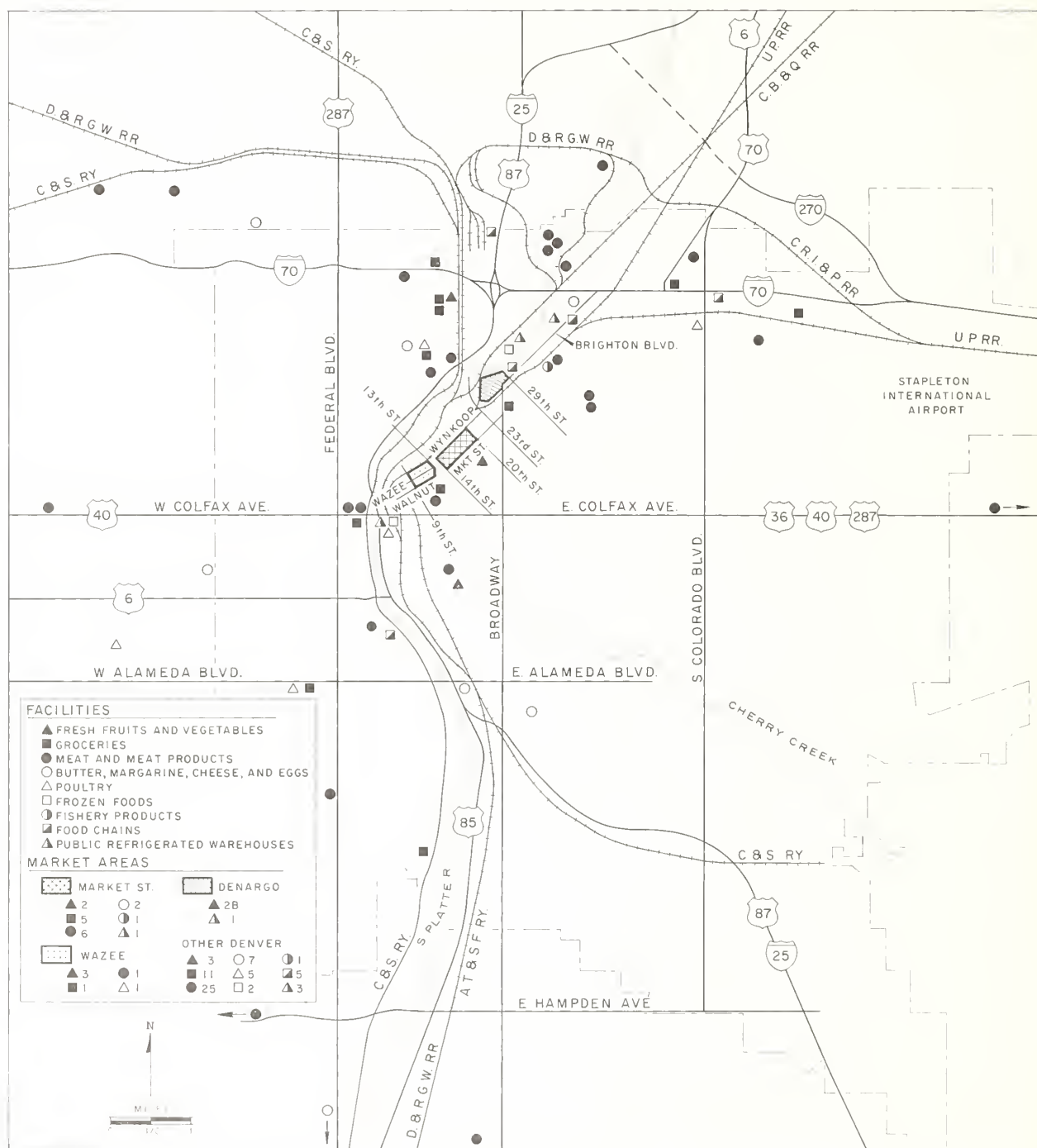


FIGURE 1.—Location of independent food firms, food chains, and public refrigerated warehouses in Denver, Colo.

layout impractical and storage on upper levels expensive. Because of the age and deteriorated condition of these buildings, health and sanitary codes are difficult to enforce and the risk

of fire is great. Facility insurance rates are relatively high.

The streets in the market area are too narrow for today's traffic and are often blocked by





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FIGURE 2.—Traffic bottlenecks at the Market Street Market.



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FIGURE 3.—Unloading from trailer trucks parked at an angle in the Market Street Market.

trucks unloading at the market. (fig. 2). Many of the service streets in the market are heavily traveled during commuter "rush hours," adding to the unloading and loading delays.

Front sidewalks serve as loading and unloading areas for many dealers. But even those dealers fortunate enough to have truck docks and platforms find areas for maneuvering trucks restricted. Many trailer trucks must park at awkward angles, causing difficulties in unloading (fig. 3).

Public parking is inadequate for peak sales periods. Private parking is available but at relatively high cost.

### Wazee Market

In 1939 the Wazee Market was constructed adjacent to the Market Street Market (fig. 4). Its boundaries are 13th Street on the northeast, Walnut Street on the southeast, Wazee Street on the northwest, and 9th Street on the southwest. Over the years, it has gradually changed from a produce market to a more diversified market which includes several nonfood firms.

Today, six food wholesalers are located in and around the Wazee Market. In this study, food wholesalers located within a few blocks of the market are considered as being within it, although only one of the six is actually within the market boundaries.

The food firms are in old, outdated buildings. Ceiling heights are low, restricting the effective use of modern materials-handling equipment, and lighting is often poor. Improper size and type of doors add to handling problems. In general, operating methods are restricted because the old warehouses are not built for modern handling methods.

Although parking is adequate at Wazee, highway accessibility is generally poor.

### Denargo Market

The Denargo Market was completed in 1939 (fig. 5). It was developed through the joint efforts of the Union Pacific Railroad Company and the Growers' Public Market Association.

The 60-acre site is located north of the Market Street Market and south of the stock-

yards area. It is bounded on the northeast by 29th Street; southeast, by the Broadway viaduct, Brighton Boulevard, and the Union Pacific's yard facilities; southwest, by the 23rd Street viaduct and the Chicago, Burlington, and Quincy's roundhouse facilities; and northwest by the Platte River. The market contains 28 fresh fruit and vegetable dealers as well as a refrigerated warehouse, offices, railroad team tracks, house tracks, and two restaurants.

In the past, the Denargo Market has been described as an outstanding market of the West. Although the facilities are still relatively good, high labor costs because of the inability to utilize modern materials-handling methods add to the costs of marketing produce. Also, a few large firms in the market have grown even larger and their existing facilities are inadequate.

Rail traffic is very low compared with that of past years and there has been a major increase in the amount of truck traffic. Large over-the-road trucks often block streets so that tractors must be disengaged and removed from trailers to permit other traffic to pass on the streets through the market (fig. 6).

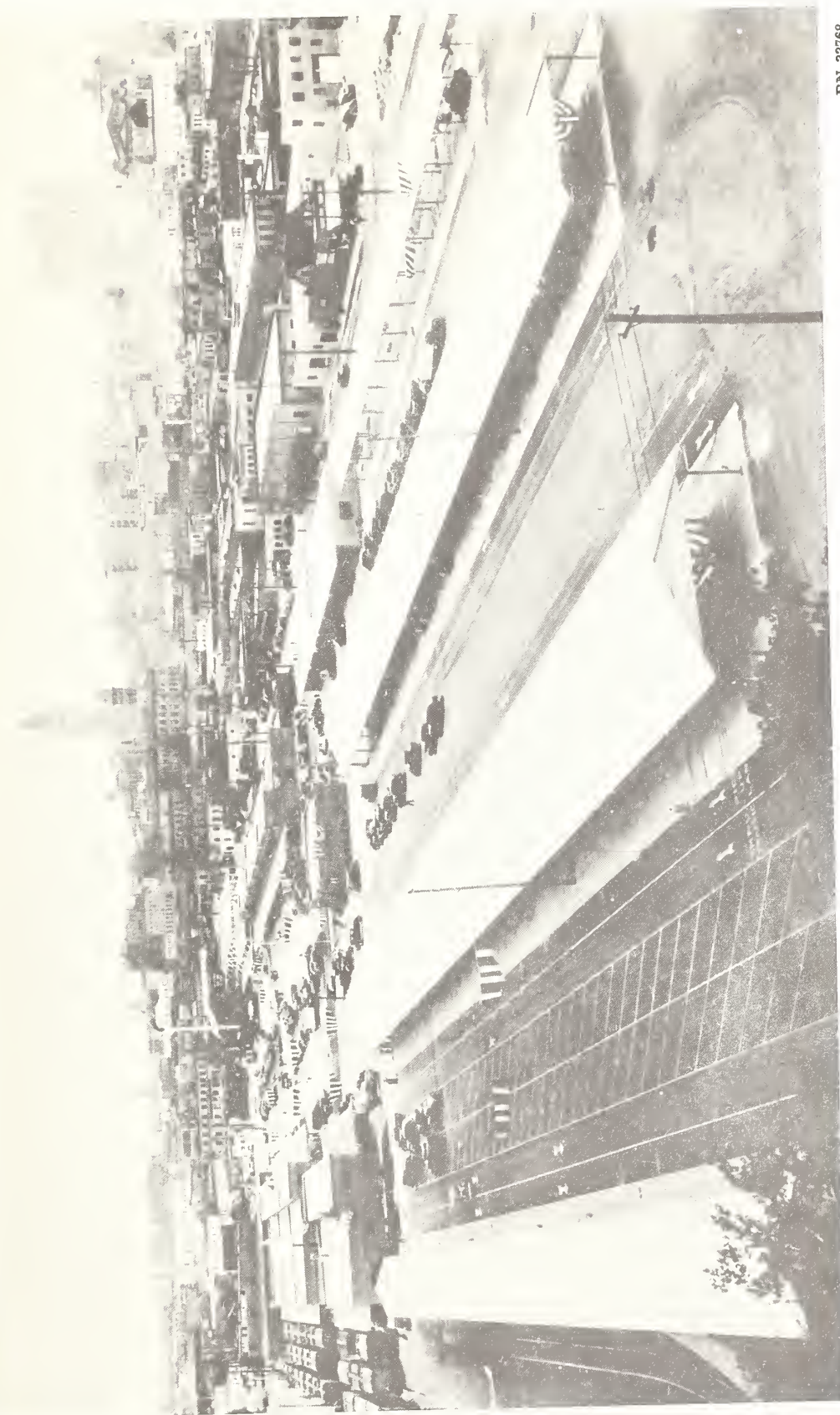
Local farm food production has declined to such an extent that the open-stall buildings once used in handling this production is now used to store lumber.

### Other Denver Facilities

"Other Denver" refers to all the independent wholesale food facilities within the metropolitan area that are not located in either the Market Street, Wazee, or Denargo markets. In all 54 independent food wholesalers and three public refrigerated warehouses are within this category.

Some of the facilities of the independent food wholesalers are modern and efficient while others are obsolete and inefficient. A few progressive firms have computerized operations and have highly mechanized handling systems, but others are without such basic needs as adequate storage space and must use commercial storage to supplement their own. Direct rail service is available only in commercially zoned districts having existing trackage.





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FIGURE 4.—Opening day at the Wazee Market.



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FIGURE 5.—An aerial view of the Denargo Market.





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FIGURE 6.—Tractors are disengaged from trailers to permit traffic to pass.

These wholesalers, generally, do not have problems with traffic delay and congestion and customer and employee parking.

Of the three public cold storage facilities within this category, two are located a few blocks north of Denargo and the other is south of the old Wazee Market.

### Tenure Status and Space Utilization

Of the 104 independent food wholesalers, 66 rent and 38 own the facilities they occupy. The

total building floorspace occupied by the independent wholesalers totals more than 1¼ million square feet, or approximately 29 acres. Basements and space above first floor area are included in this figure. Dry storage space represented about 51 percent of the total while cooler-freezer areas accounted for 21 percent. The remaining 28 percent consisted of space for processing, order assembly, supply office, and sales. Specific space utilization by commodity group is shown in table 2.

TABLE 2.—Tenure status and use of space, 104 independent food firms by type of firm, Denver, 1966

Type of food firm	Tenure status <sup>1</sup>			Space occupied					
	Rent	Own	Total	Cooler storage	Freezer storage	Dry product storage	Processing, assembly supply area	Office-sales area	Total
	Num-ber	Num-ber	Num-ber	Square feet	Square feet	Square feet	Square feet	Square feet	Square feet
Fresh fruits and vegetables	30	5	<sup>2</sup> 36	80,398	3,028	146,936	59,960	12,957	303,279
Groceries	11	6	17	22,554	12,813	318,523	20,096	50,362	424,348
Meat and meat products	17	15	32	78,199	13,673	95,877	117,828	22,313	327,890
Butter, margarine, cheese, and eggs	4	5	9	7,385	1,150	35,260	30,446	4,199	78,440
Poultry	1	5	6	15,400	3,795	10,525	16,300	5,290	51,310
Frozen foods and fishery products	3	1	4	1,100	25,140	28,260	10,135	3,305	67,940
Total	66	37	104	205,036	59,599	635,381	254,765	98,426	1,253,207

<sup>1</sup> If more than 1 facility was used, the firm's primary facility established the tenure status.

<sup>2</sup> Includes 1 trucker-jobber who shared facilities with a tenant wholesaler.

## FOOD SOURCES AND DISTRIBUTION PATTERNS

Direct receipts from sources within the State of Colorado amounted to 97,629 tons, or 28 percent of the total tonnage received by independent food firms. The remaining 250,137 tons, or 72 percent came from suppliers in other States (table 3).

Although independent dealers received about 347,766 tons of food for distribution, they actually handled and moved a total of about 407,690 tons through their facilities when interdealer transfers were included. Total interdealer transfers, volume handled more than once by transfer between dealers, amounted to 59,924 tons, or about 15 percent of the actual

volume distributed through independent facilities.

Figure 7 shows the movement of food products from the first point of arrival through independent distribution facilities within Denver. Approximately 268,925 tons, or 77 percent of the total amount received direct by independent firms, were distributed within the State of Colorado. The remaining 78,841 tons, or 23 percent, were distributed to points out-of-State. Of the percentage distributed within the State, 62 percent was distributed within the Denver Metropolitan Area and 15 percent outside the area.

TABLE 3.—*Sources of products handled by 104 independent food firms in Denver, 1966*

Type of food firm	Source of supply		Total direct receipts	Inter-dealer transfers	Total volume handled
	Colorado	Out of State			
	<i>Tons</i>	<i>Tons</i>	<i>Tons</i>	<i>Tons</i>	<i>Tons</i>
Fresh fruits and vegetables ---	17,609	114,791	132,400	36,478	168,878
Groceries -----	2,143	80,299	82,442	6,588	89,030
Meat and meat products -----	62,713	11,857	74,570	13,159	87,729
Butter, margarine, cheese, and eggs -----	5,528	20,304	25,832	3,031	28,863
Poultry -----	9,527	12,077	21,604	668	22,272
Frozen foods and fishery products -----	109	10,809	10,918	( <sup>1</sup> )	10,918
Total -----	97,629	250,137	347,766	59,924	407,690

<sup>1</sup> Negligible amount.

## SELECTED COSTS INCURRED BY FOOD FIRMS

The handling and distributing of food through existing facilities was often found to be inefficient and costly. Modern handling equipment often was used ineffectively, if used at all, because antiquated facilities restricted their proper use or the food dealer did not adapt the proper equipment to his specific operation. Inefficient facilities and lack or misuse of modern handling equipment add significantly to marketing costs.

Selected costs measured in this report are confined to those for (1) moving commodi-

ties from initial Denver points of receipt to dealer facilities, (2) handling and storing within the market, and (3) distributing commodities from dealer facilities to their customers. These are costs of handling food that are affected by the firm's facility, equipment, and location. They will be compared later in the report with the costs that might be expected in improved facilities. The costs of items such as management, office personnel, and utilities are not included, because they will remain about the same regardless of the facil-

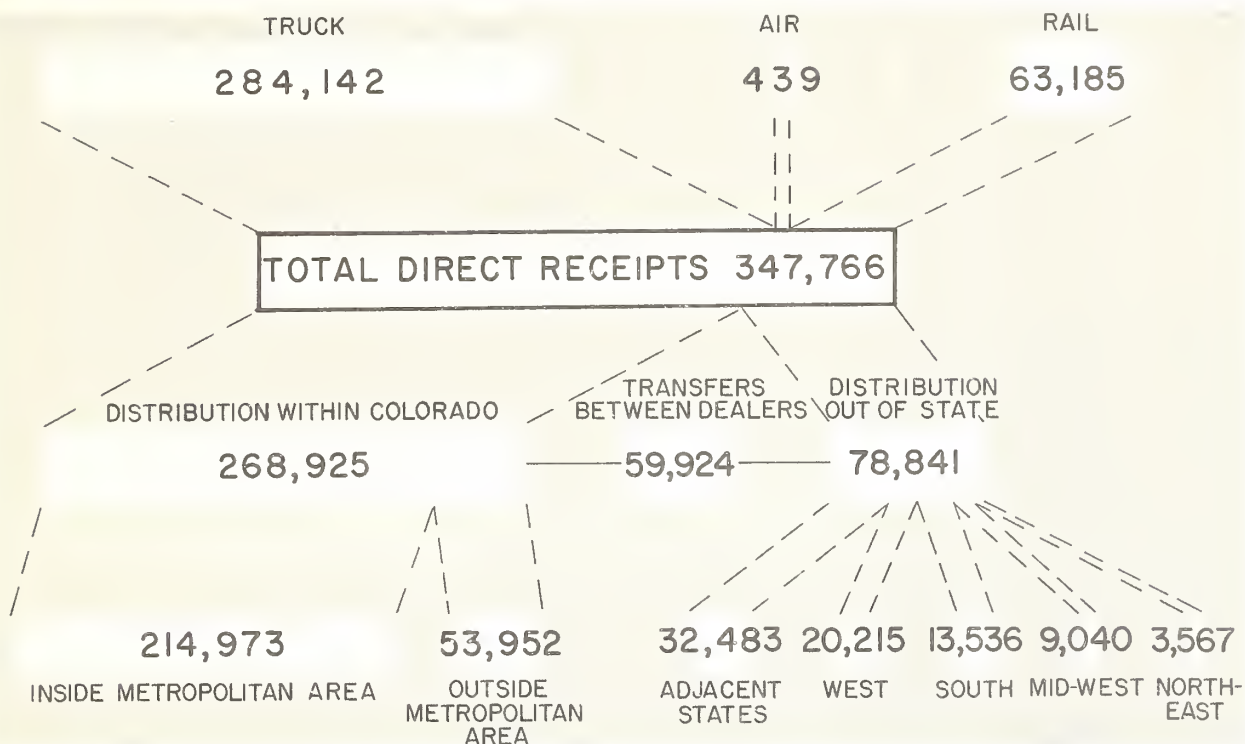


FIGURE 7.—Flow of food commodities (tons) handled through independent wholesale food marketing facilities, Denver, 1966.

ity. Costs associated with shipping food from producing areas to Denver were not estimated, nor costs involved in distributing food out-of-State.

### Moving Food From First Point of Arrival to Wholesale Facilities

Costs incurred in moving commodities from initial points of receipt to dealers' facilities include cartage and avoidable delays to inbound vehicles. Cartage costs are the costs of loading commodities into trucks at team tracks or the airport and moving them to the wholesale facility. Delays encountered when inbound trucks are not able to unload due to either traffic congestion or lack of dealer unloading space were considered avoidable.

Of the 347,766 tons moved to food dealers' facilities about 1 percent was charged with cartage while about 6 percent of the total amount was involved in avoidable delays. Total estimated cost for cartage and avoidable delays was \$12,600 (table 4). The rest—344,832 tons—was shipped directly to dealers.

### Handling Within the Market

Costs for handling within the market include unloading commodities from trucks or railcars at dealers' facilities; moving commodities into the facilities and handling and storing them; transferring commodities between dealers; and moving commodities out of dealers' facilities and loading them into trucks for delivery. These costs also include sorting, order selecting, and order assembly.

With the exception of meat and meat products firms, most wholesalers did not perform processing functions and no cost was allocated to this activity. Meat processing costs were included because Denver meat wholesalers tend to specialize in processing fabricated products since most meat sold in carcass form is supplied direct from local slaughters.

Other costs associated with handling food commodities within the market were public warehouse service charges, handling equipment costs, facility rents, and services, and losses attributed to waste, theft, and product deterioration. Facility service costs included



TABLE 4.—*Estimated annual cost of moving products to present facilities, 104 independent food firms, Denver, 1966*<sup>1</sup>

Type of food firm	Volume <sup>2</sup>	Cartage		Avoidable delays			Total cost
		Cost		Volume	Cost		
		Per ton <sup>3</sup>	Total		Per ton <sup>3</sup>	Total	
	<i>Tons</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>Tons</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
Fresh fruits and vegetables	1,589	3.52	5.6	7,563	0.13	1.0	6.6
Groceries	989	3.03	3.0	1,649	.18	.3	3.3
Meat and meat products	149	3.36	.5	3,356	.21	.7	1.2
Butter, margarine, cheese, and eggs	--	--	--	8,975	.03	.3	.3
Poultry	--	--	--	<sup>4</sup>	<sup>4</sup>	--	--
Frozen foods and fishery products	207	5.80	1.2	<sup>4</sup>	<sup>4</sup>	--	1.2
Total or average	2,934	3.51	10.3	21,543	.11	2.3	12.6

<sup>1</sup> Cartage costs from team tracks and the airport and avoidable delay to all inbound trucks; see appendix table 13.<sup>2</sup> Excludes 344,832 tons shipped direct to wholesalers' facilities.<sup>3</sup> Rounded to the nearest cent.<sup>4</sup> Negligible amounts.

protective services, insurance charges, and garbage collection.

The estimated annual cost of labor, equipment, and related market costs within present facilities was nearly \$10 million, or \$28.74 per ton (table 5). Itemized costs for each selected function is shown by type of food firms in appendix table 13.

TABLE 5.—*Estimated annual cost of labor and related handling costs within present facilities, 104 independent food firms, Denver, 1966*<sup>1</sup>

Type of food firm	Volume	Cost	
		Per ton <sup>2</sup>	Total
			1,000 dollars
Fresh fruits and vegetables	132,400	6.88	910.3
Groceries	82,442	11.74	967.8
Meat and meat products	74,570	<sup>3</sup> 96.95	7,229.3
Butter, margarine, cheese and eggs	25,832	17.38	448.9
Poultry	21,604	12.28	265.3
Frozen foods and fishery products	10,918	15.74	171.9
Total or average	347,766	28.74	9,993.5

<sup>1</sup> See appendix table 13.<sup>2</sup> Rounded to the nearest cent.<sup>3</sup> Includes processing costs.

## Distributing Food From the Market

The cost of distributing commodities includes the costs from the time the trucks are loaded at wholesale facilities until they return from their destinations. These costs included estimated vehicle cost and labor cost for drivers

TABLE 6.—*Estimated annual cost of distributing products within Colorado from present facilities of 104 independent food firms, Denver, 1966*<sup>1</sup>

Type of food firm	Volume <sup>2</sup>	Cost	
		Per ton <sup>3</sup>	Total
			1,000 dollars
Fresh fruits and vegetables	106,185	4.37	464.1
Groceries	71,807	6.37	457.4
Meat and meat products	42,207	7.70	325.0
Butter, margarine, cheese, and eggs	21,673	5.29	114.7
Poultry	16,484	3.45	56.9
Frozen foods and fishery products	10,569	7.91	83.6
Total or average	268,925	5.58	1,501.7

<sup>1</sup> See appendix table 13.<sup>2</sup> Excludes 78,841 tons distributed out of State.<sup>3</sup> Rounded to the nearest cent.

and helpers. Traffic delays encountered by trucks waiting to be loaded at dealer facilities were also included as part of the distribution costs.

The total estimated cost for distributing commodities within the State of Colorado was \$1.5 million, or an average of \$5.58 per ton (table 6).

## Summary of Selected Marketing Costs

Total selected costs for moving 347,766 tons of food through present independent Denver wholesale facilities was \$11.5 million in 1966 (table 7). The highest costs occurred in labor and related handling cost operations. Improvements in the marketing system would reduce these costs.

TABLE 7.—*Summary of estimated annual costs of moving 347,766 tons of products through present facilities of 104 independent food firms, Denver, 1966*<sup>1</sup>

Cost item	Fresh fruits and vege- tables	Groceries	Meat and meat prod- ucts	Butter, margarine, cheese and eggs	Poultry	Frozen foods and fishery products	Total
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars
Movement to wholesalers' facilities -----	6.6	3.3	1.2	0.3	--	1.2	12.6
Handling within the market -----	910.3	967.8	7,229.3	448.9	265.3	171.9	9,993.5
Distribution from market areas <sup>2</sup> -----	464.1	457.4	325.0	114.7	56.9	83.6	1,501.7
Total costs -----	1,381.0	1,428.5	7,555.5	563.9	322.2	256.7	11,507.3

<sup>1</sup> Based on appendix table 13.

<sup>2</sup> Excludes 78,841 tons distributed out of State.

## THE NEED FOR NEW FACILITIES

In many respects, present market facilities in Denver are far from ideal. Efforts have been made to improve them but they are still inadequate and will become more so in the future. Few firms operate in modern, well-planned buildings. Principal deficiencies are (1) inadequate facilities, (2) nonunified markets, and (3) lack of market regulation. These defects contribute to higher costs of food marketing.

### Inadequate Facilities

Many facilities occupied by food firms in Denver were built at the turn of the century. The buildings were designed for warehousing methods of that era. Streets may have been adequate for traffic conditions that existed then but do not meet today's needs. Few firms are served by direct rail or have proper docking

facilities for loading and unloading operations. Buildings are crowded together and there is no space for expansion. Stairways are often inconveniently located and antiquated freight elevators are slow. Ceiling heights and support columns often prohibit improving interior layout. Storage on upper levels is expensive. Difficulties are often encountered with work procedures and use of equipment. Frequently, the only equipment a firm uses is two-wheel handtrucks. Refrigeration, electrical wiring, sewage facilities, ventilation, and air circulation are not adequate. Employee accommodations are often poor; some firms have limited parking space; and the hours of operation are unduly long.

Serious inadequacies in facilities contribute more to the unnecessarily high cost of distributing food than any other single factor. The

reason for this is due primarily to the extra labor necessary to conduct operations from unsuitable facilities.

### Nonunified Markets

Lack of a centralized market creates inefficiencies in both the receiving and distributing food products. When dealers are scattered, additional transportation and handling operations are required which contribute to product spoilage and deterioration.

Some dealers maintain operations in more than one location. These split operations increase costs, and complicate inventory control. Retail buyers who shop the market find it costly to assemble merchandise to acquire the kinds, amounts, and varieties of commodities needed. Intermarket transfers among wholesale dealers are adversely affected by the added expense and time needed to complete transfers to scattered facilities. Economic advantages gained by these transfers between dealers often are offset by the high cost involved in making such transfers.

### Lack of Market Regulation

A modern food distribution center should function as a unit if it is to serve the metropolitan area efficiently. When segments of a market are scattered and unorganized, regulations governing market operations and practices, such as establishing uniform hours of operation, are difficult to enforce. The lack of control over business hours means longer workdays, excessive exposure of perishables, and greater fluctuations in prices during selling periods. Regulated hours of operation would eliminate such problems. Regulations are also needed to maintain proper sanitation standards, provide security police and fire protection, control intramarket traffic, and maintain other services.

Individual dealers, as well as firms patronizing and servicing the markets, usually find it to their advantage to have some regulations. However, authority to coordinate and regulate these marketing activities should be achieved without unnecessarily limiting the freedom of individual firms to conduct business.

## PLANNING A FOOD DISTRIBUTION CENTER

There are alternative courses of action that firms can take to improve present market conditions. Some firms can remain in their present facilities and make improvements. Another possibility is that they could go out individually to obtain new facilities apart from other food firms. However, if firms stay where they are and try to improve what they have, they may not be able to make enough improvements to remain competitive. If they seek facilities individually on their own, they may not be able to do it at the least cost and still acquire all the facilities needed.

Problems such as narrow streets, lack of direct rail facilities, narrow platforms, crowded work space, low ceiling heights, and lack of room for expansion can be solved best by establishing a new, modern food distribution center specifically designed to handle food products in the most efficient manner possible. If food firms move together as a group into one centrally located market, certain benefits can

be realized, such as economies in construction and, therefore, lower initial cost. Nonmarket traffic could be kept out of the area. There can be better land utilization, better rail and truck line services, more attractive financing, lower rates for insurance and utility installation charges. With a sufficient number of distributors in one area, common services could be provided such as central refrigeration, garbage collection, and snow removal. Consolidation of facilities could reduce interfirm transfer costs by reducing crosshauling from one part of the city to another.

In a consolidated food distribution center, better communication and inspection service can be provided. Distributors who do not buy in carload lots could still take advantage of carlot savings by pooling their orders. Also savings are possible through pooled delivery services which would lower distribution costs and reduce the number of trucks traveling on metropolitan streets and highways.



Such a center could house all types of food firms wanting to relocate now and those who desire to do so in the future. Some firms want to move to new facilities but have not taken steps to do so. This, together with areas scheduled for urban renewal, represents a real and pressing need for a long-range program of facility development.

Sound planning is based upon the consideration of all factors that affect the efficiency and usefulness of the proposed food distribution center. Facilities for such a market must be organized within the framework of a master plan specifically designed to handle food efficiently. Essential factors involved in market design include the following: (1) Accommodation for all types of food dealers and allied industry firms needing new facilities; (2) adequate facilities designed to satisfy individual food dealer needs; (3) suitable facility arrangements on a given site with provisions for adequate future expansion; (4) sufficient vehicle access, traffic circulation, and parking in addition to rail accessibility; (5) proper market location with sufficient land at reasonable cost; and (6) sound management to coordinate the proposed market's functions and daily activities. In addition, the proposed facilities must be designed so that modern, product-handling systems can be fully implemented to reduce operating costs and to provide the best working conditions possible for employees. The proposed facilities should be designed to provide for palletization and tier stacking.

Handling and distributing methods are constantly being improved in the food industry. Therefore, planned facilities should be versatile, functional, relatively inexpensive, and constructed to withstand heavy use.

## Proposed Facilities

The recommended facilities are based upon the needs of independent firms expected to move to the food distribution center. Expansion areas for these and other wholesalers are based upon projected facility requirements. However, the actual number of facilities constructed should be based upon the needs of responsible tenants who sign firm leases. This will prevent

overbuilding and insure occupancy of all facilities.

Of the 104 independent food dealers in the Denver area, 65 firms have need for and would benefit from new facilities (table 8). These 65 firms handle 217,000 tons of food, more than 62 percent of the annual volume handled by independents. New facility recommendations for these firms represent about half the space they now occupy. The master plan also includes a public refrigerated warehouse to serve the center. Some of the remaining 39 firms are considered long-range prospective tenants. Others have new facilities and would not benefit from a move. Facilities are not planned for these dealers nor for wholesalers who might lose their locally oriented business if they moved.

Two basic types of buildings, multiple-occupancy and single-occupancy, are needed for wholesalers who would move to the proposed center. A multiple-occupancy building is designed for several firms with small to moderate volumes. Individual sections within this multiple facility are referred to as units and contain between 2,850 and 4,300 square feet each. Temporary or removable partitions between units permit adjustments in floorspace requirements. Firms with space needs up to 15,000 square feet can be accommodated by leasing several units adjacent to each other. A single-occupancy building is recommended if a firm's space requirements are 15,000 square feet or more.

The initial needs of the 65 firms included in the master plan as well as suggested facilities for a refrigerated warehouse operator could be met with the following:

1. Six multiple-occupancy buildings containing a total of 254,080 square feet of floorspace with one of the 77 units set aside for a restaurant.
2. Six single-occupancy buildings containing 132,500 square feet of floorspace.
3. A public refrigerated warehouse containing 86,000 square feet of floorspace.
4. Double house tracks to those facilities requiring rail service with provisions for 117 railcars.

TABLE 8.—*Number of independent food firms planned for in the proposed food distribution center, annual receipts, facilities recommended, and present and proposed floorspace*

Type of food firm or facility	Firms	Annual direct receipts in 1966	Proposed facilities		Present floor- space occupied	Proposed floor- space <sup>1</sup>
			Multiple- occupancy	Single- occupancy		
	<i>Number</i>	<i>Tons</i>	<i>Buildings</i>	<i>Units</i>	<i>Buildings</i>	<i>square ft. 1,000</i>
Fresh fruits and vegetables -----	31	121,194	2	<sup>2</sup> 44	1	281
Groceries -----	11	32,849	1	11	2	175
Meat and meat products -----	15	34,865	1	16	2	170
Butter, margarine, cheese, and eggs -----	4	21,091	1	1	1	58
Poultry -----	2	<sup>3</sup>	1	2	0	12
Frozen foods and fishery products -----	2	<sup>3</sup>	1	3	0	50
Refrigerated warehouse -----	--	--	0	0	1	<sup>5</sup>
Total -----	65	<sup>6</sup> 217,261	6	77	7	<sup>5</sup> 472

<sup>1</sup> Includes platforms and mezzanines.<sup>2</sup> Includes 1 unit for a restaurant.<sup>3</sup> Not shown to avoid disclosure of confidential data.<sup>4</sup> Facilities for a frozen food dealer are included in the refrigerated warehouse.<sup>5</sup> Not ascertained.<sup>6</sup> Includes receipts for poultry, frozen foods, and fishery product groups.

5. Paved center streets at least 200 feet wide and other streets at least 75 feet wide.

6. Parking space for about 600 vehicles in addition to the loading and unloading space at building platforms.

7. Space for allied industries and for future expansion.

Certain basic features are incorporated into multiple-occupancy food distribution facilities. First floor areas in each unit are concrete and have a nonskid surface sloped to drains. These floors are designed to support a live load capacity of at least 400 pounds per square foot to permit mechanical stacking operations. The enclosed part of each unit is provided with an unobstructed stacking height of 21 feet, except for meat units which have a ceiling height of 12 feet. The ceilings for the meat units, however, can be removed to provide a 21-foot stacking height should present meat rail systems become obsolete. Each unit has a mezzanine area for office and welfare needs. Mezzanines are located directly over the front platforms and are designed to support a live

load of 100 pounds per square foot. Meat units, however, have a second floor area to provide for these needs.

Floor insulation for refrigerated areas should be installed during initial construction; therefore the location of coolers and freezers should be determined in advance. Refrigeration equipment could be placed either in a utility tunnel or elsewhere as proper installation may dictate. Specific refrigeration needs vary markedly among dealers. Each firm may desire to install its own refrigeration equipment.<sup>2</sup> However, an option to purchase metered refrigerant from a central source should be considered.

Unpublished studies by the Department indicate that savings are possible through the use of a centralized refrigeration system, as opposed to dealers utilizing individual equip-

<sup>2</sup> Guides for specific refrigeration requirements can be obtained from *The Ashrae Guide and Data Book for Systems and Equipment*, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., New York, 1967.



ment. Interior heating requirements could be satisfied by blower-type units conveniently located within the facilities, or from a centralized heating system similar to the refrigerant system. Specific heating needs could be determined by consulting the source suggested for refrigeration requirements.

Interior lighting requirements will vary according to market operations performed. Therefore, the precise level of lighting used by each firm must be determined by specific operations.<sup>3</sup> Normally, about 15 foot-candles of light intensity is satisfactory for use in general storage areas and about 20 foot-candles in the office areas.

Platforms will extend the entire length of each multiple-occupancy facility. These docks should be sloped to provide drainage and have rubber bumper guards placed along the edges to prevent damage by trucks being positioned. Pedestrian access steps should also be installed in the platforms where needed. Front platforms facing the street should be at truck-bed height—45 inches from grade level. Rear platforms facing recessed tracks should be at rail-car door level—55 inches above the rails for refrigerated cars, and 45 inches for boxcars—depending on the commodities handled. Both front and rear platforms should be provided with protective canopies for loading-unloading operations during bad weather.

Both multiple-occupancy and single-occupancy facilities should conform to applicable building codes, and health and sanitary requirements, in addition to the overall master plan for the market.

### ***Fresh Fruits and Vegetables***

Two multiple-occupancy buildings, containing 44 units, and one single-occupancy facility are proposed for 31 fresh fruit and vegetable dealers. The two multiple-occupancy buildings would house 30 of these firms, the single-

occupancy building, the remaining firm. One unit in a multiple-occupancy facility would be set aside for use as a restaurant, leaving 43 units for the 30 fresh fruit and vegetable firms.

The enclosed space of each unit is 25 feet wide by 72 feet deep, with a sloping ceiling height of 22 to 21 feet. Front and rear platforms, 14 feet deep, extend the entire length of the building. A layout and cross section of one unit are shown in figure 8. The mezzanine area—14 feet deep by 25 feet wide—provides office and restroom space directly over the front platform. A protective canopy 16 feet from the ground extends 6 feet from the front platform.

The protective roof cover over the rear platform is 17 feet above the rail tracks and is supported by guy rods to provide unobstructed operating space beneath. A front access entrance 8 feet wide and 8 feet high is fitted with an overhead door while a similar sized rear entrance is fitted with a sliding door. An entrance for pedestrian use in the front opens directly to a stairway leading to the mezzanine area.

The interior arrangement concerning storage, refrigeration, and equipment layout must be tailored to meet specific firm needs. General recommendations are that three-tier storage racks be installed with adequate space for air circulation. Each unit contains a total of 2,850 square feet of space: 2,500 square feet of first floor area, and 350 square feet of mezzanine area. The proposed 25,000 square-foot single-occupancy building should also be designed for the specific needs of the tenant. Total floor-space for the 31 produce dealers and restaurant is approximately 151,000 square feet, or about 32 percent of the facility space planned for the food center.

### ***Groceries***

One multiple-occupancy building containing 11 units and two single-occupancy buildings are proposed for 11 grocery wholesalers. Nine of these wholesalers would have space in the multiple-occupancy buildings, while the remaining two would be accommodated in single-occupancy buildings.

<sup>3</sup> Guides for specific lighting requirements can be obtained from *The Illuminating Engineering Society Lighting Handbook*, Illuminating Engineering Society, Inc., New York, 1966.

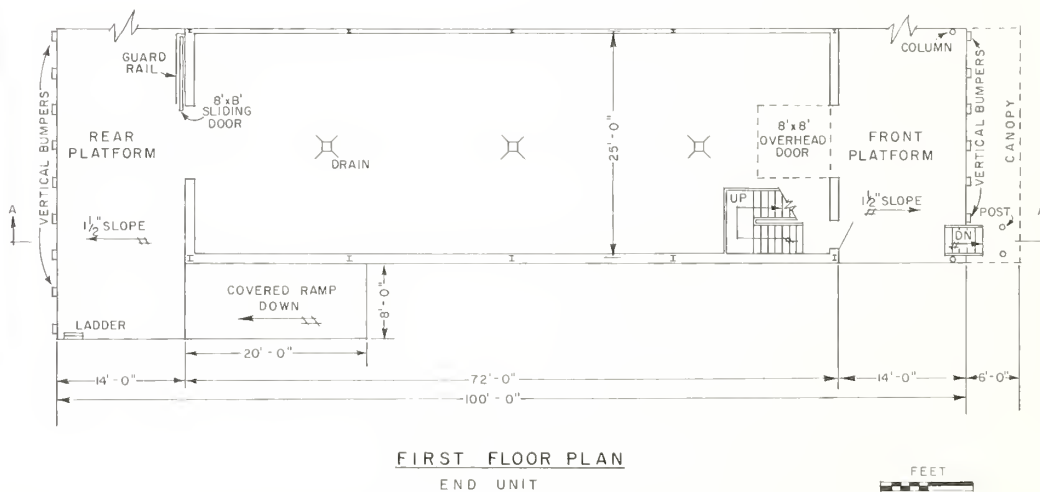
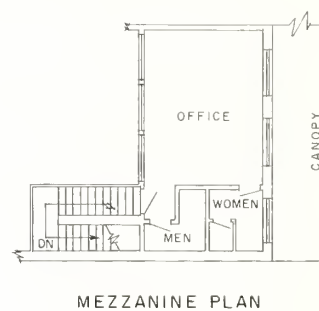
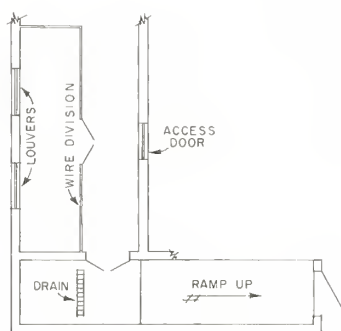
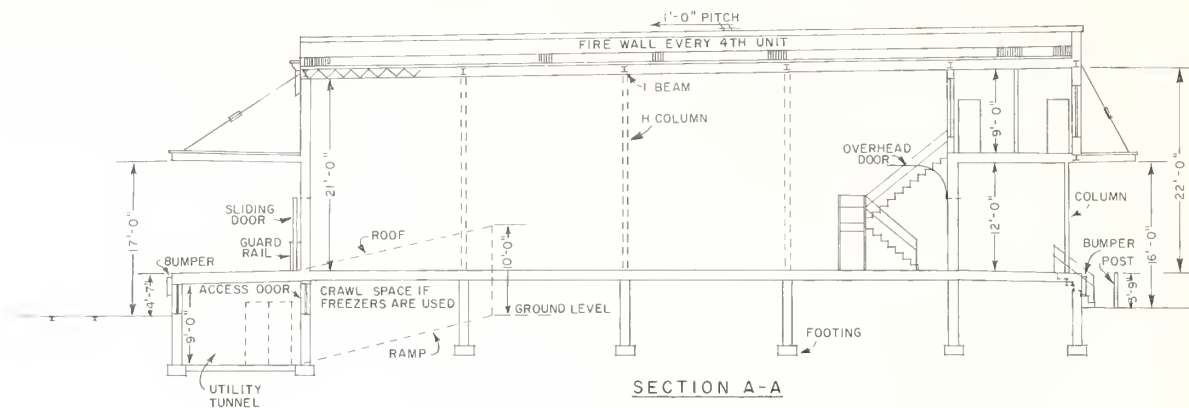


FIGURE 8.—Layout of a fresh fruit and vegetable unit in a multiple-occupancy building. *Notes:* 1. The use of a utility tunnel is optional. Without the tunnel, refrigeration equipment could be located on the roof and utility lines along walls inside the building. 2. Buildings shown have support columns. Recent studies, completed during the writing of this report, indicate there would be little or no increase in cost to construct this building without support columns.

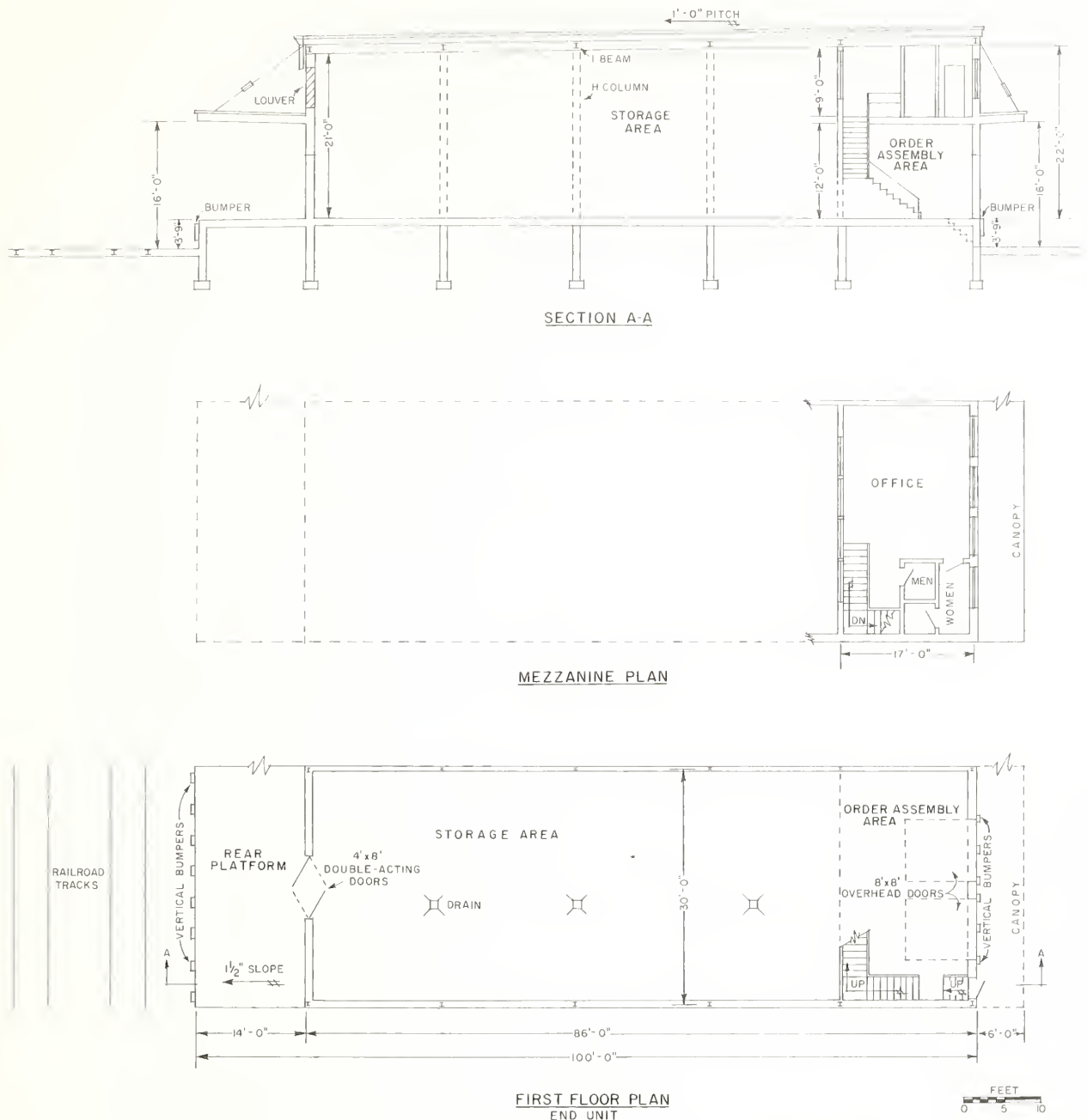


FIGURE 9.—Layout of a grocery unit in a multiple-occupancy building. *Note:* Buildings shown have support columns. Recent studies, completed during the writing of this report, indicate there would be little or no increase in cost to construct this building without support columns.

Each unit in the multiple-occupancy building is 30 feet wide by 100 feet deep, with a sloping ceiling height of 22 to 21 feet. The overall 100-foot depth includes a 14-foot rear platform (fig. 9). The front platform in these units is

enclosed and is a part of the building's interior.

Truck receipts are received directly into the facility. An office mezzanine area 30 feet wide by 17 feet deep is located over the truck load-

ing area and contains restrooms. Protective canopies similar to those recommended for the produce units are located to the front and rear of the grocery facilities. Two front access-entrances 8 feet high and 8 feet wide are fitted with overhead doors. A single entrance at the rear is fitted with two 4- by 8-foot-double-acting doors. A ground level pedestrian entrance in the front leads directly to the office staircase and the storage area on the main floor.

The three-tier pallet racks should be utilized for all applicable storage functions. Each unit contains a total of 3,510 square feet of space which includes 3,000 square feet of first floor area and 510 square feet of mezzanine area.

Two proposed single-occupancy buildings containing 18,000 and 30,000 square feet are also included in the master plan. These facilities will serve two large-volume dealers. The combined floorspace proposed for the 11 grocery firms totals almost 87,000 square feet, or about 18 percent of the total space planned.

### ***Meat and Meat Products***

One multiple-occupancy facility, containing 16 units, and two single-occupancy facilities are proposed for 15 meat purveyors and processors. The multiple-occupancy building would provide the space needed by 13 of these firms. The other two firms would require single-occupancy buildings because of the size of their operations.

The enclosed first floor area of each unit is 25 feet wide and 72 feet deep, with a ceiling height of 12 feet. Both front and rear platforms are 14 feet deep, increasing the overall facility depth to 100 feet. The enclosed dimensions of the second floor are also 25 by 72 feet with a sloping ceiling height from 9 to 8 feet. The overall interior ceiling height in these units ranges from 22 to 21 feet. Both exterior platforms are covered to provide protection during loading-unloading operations.

A future shift from shipments of carcass meat to boxed meat could eliminate the need for conventional meat rail systems in these facilities. If this should occur, a pallet stacking system would be required to replace the over-

head meat rails. Therefore, the second floor in these units should be constructed so it can be removed at minimum expense to create a clear ceiling height at least 21 feet for possible pallet stacking operations.

Figure 10 shows the overall design of a typical meat unit and how the interior might be arranged. In this layout the entire first floor is refrigerated. Equipment should be sufficient to maintain temperatures of 32° F. for the cooler, 34° to 50° for the operations and shipping areas, and -10° for freezer space.

The first floor areas and exterior platforms are connected by insulated double-acting doors 5 feet wide and 7 feet high. Meat rails, supported from the floor, are recommended. They should be installed about 2 feet 6 inches apart in the cooler for beef carcass storage; slightly less space is required for lamb and calf storage. One central meat rail should extend through the unit from the edge of the front dock to the edge of the rear dock. This central line should be united with two parallel meat rails that run the full length of both platforms to permit intramarket sales. The entire meat rail system extending both within the facilities and on the platforms should be placed 7 feet 6 inches from floor level, with switches and scales installed as indicated. The floor should be acid-resistant and waterproof and slope to drains for each 400 square feet of floorspace.

The utility tunnel under the front platform could house necessary grease traps in addition to the tenant's refrigeration equipment. Sufficient hot water at 180° F. should be available in each unit for cleanup operations. Units requiring steam would supply their own needs.

The second floor of the plan includes offices, a dry storage area for storing cartons, wrapping paper, and similar packaging materials, a welfare room, and restrooms. A corridor extends the entire length of the multiple-occupancy building. A freight elevator and stairwell are also provided. Packaging supplies and other material can be moved by freight elevator. Each unit contains 4,300 square feet of space—2,500 square feet of first floor area, and 1,800 square feet of second floor area.

Two proposed single-occupancy buildings



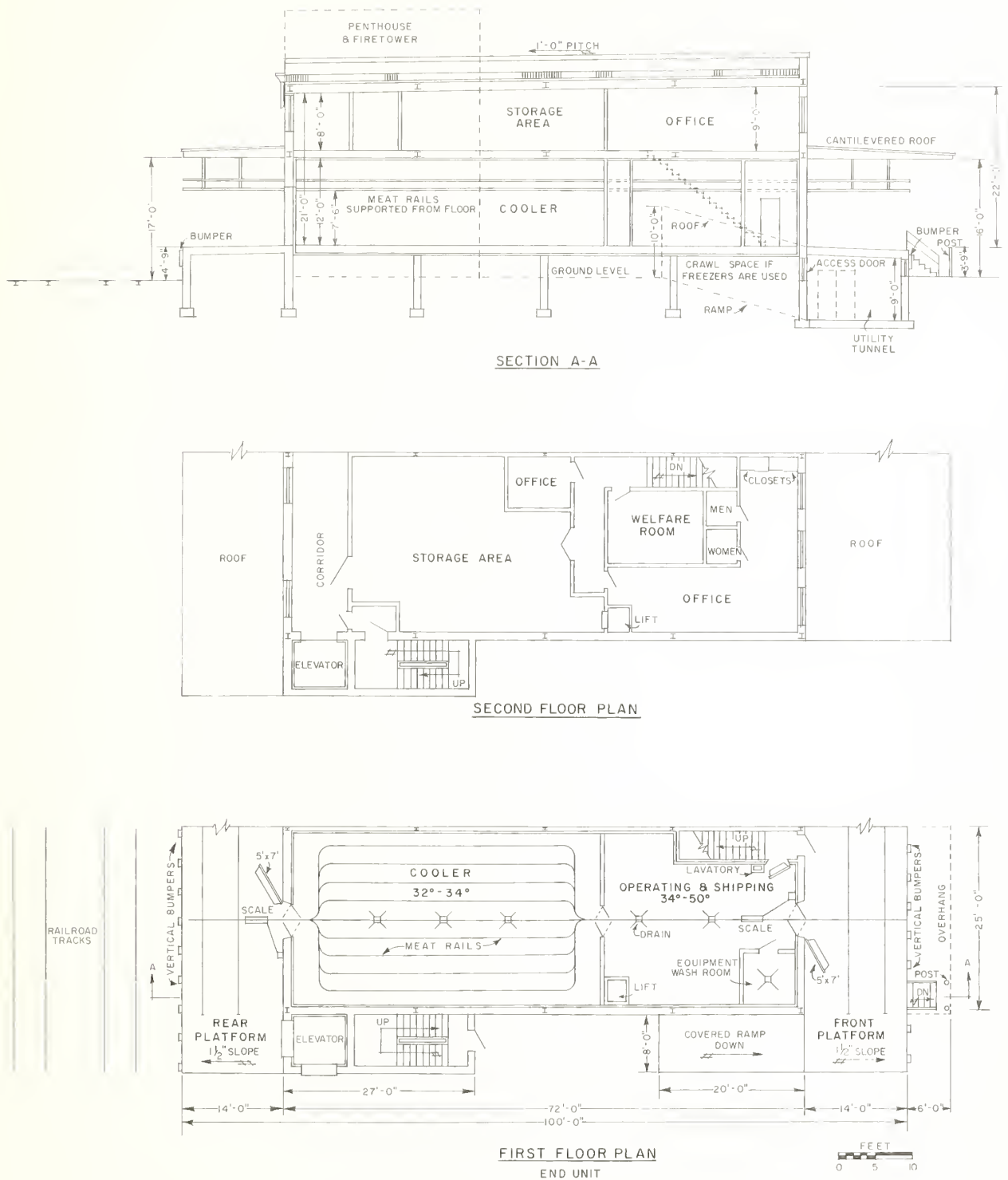


FIGURE 10.—Layout of a meat and meat products unit in a multiple-occupancy building. *Note:* The use of a utility tunnel is optional. Without the tunnel, refrigeration equipment could be located on the roof and utility lines along walls inside the building.

contain 32,500 square feet. These facilities should be designed to meet specific requirements of the tenants who will occupy them. The total floorspace for all meat firms amounts to approximately 101,000 square feet, or about 22 percent of the floorspace allocated in the master plan.

Final plans for meat facilities should be submitted to the proper Federal, State, and local authorities. Such items as sanitation, plant design, and facility construction will have to be approved before dealers begin to operate from these facilities. Requirements for Federal inspection are published by the U.S. Department of Agriculture.<sup>4</sup>

### ***Butter, Margarine, Cheese, and Eggs***

The new facility plan includes space for four dairy and egg product firms. Three small firms would share one standard store unit within a multiple-occupancy facility. The remaining firm would be housed in a single-occupancy building.

The standard unit in the multiple-occupancy building is 30 feet wide by 100 feet deep, including two 14-foot platforms at the front and rear. An office-restroom mezzanine area 14 feet deep by 30 feet wide is located directly above the front platform (fig. 11). Both platforms have protective canopies, the canopy over the front platform is 16 feet above the ground and extends 6 feet beyond the platform. The canopy over the rear platform is 17 feet above the ground. The front entrance is 8 feet wide by 8 feet high and is fitted with an overhead door. A similar rear entrance is fitted with a sliding, insulated door as illustrated. A single pedestrian entrance opens directly to a stairway leading to the office area above the front platform.

Partitions dividing individual dealer storage areas may be provided which would permit a single-coolant system to refrigerate the com-

bined dealer storage areas with maximum efficiency. Remaining cooler and noncooler space devoted to packaging and order assembly could also be divided equitably among these dealers. This multiple-occupancy unit contains a total of 3,420 square feet composed of a 3,000-square foot first-floor area and an overhead 420-square foot mezzanine.

A single-occupancy facility containing 27,000 square feet should be designed to meet the special requirements of the large-volume dealer who would occupy the building. Total floorspace for dairy products and egg firms is approximately 30,000 square feet, or about 6 percent of the proposed facilities within the center.

### ***Poultry***

Two poultry firms would require two standard store units within a multiple-occupancy building.

The enclosed space of each unit is 30 feet wide by 72 feet deep, with a sloping ceiling height of 22 to 21 feet. Both front and rear platforms are 14 feet deep, increasing the overall facility depth to a total of 100 feet. A mezzanine area 14 feet deep by 30 feet wide provides office space and restrooms directly over the front platform (fig. 12). A protective canopy 16 feet from the ground extends 6 feet over the edge of the front platform. The rear canopy is 17 feet above the ground and extends to the edge of the platform. Main entrances are 8 feet wide by 8 feet high and are fitted with either overhead or sliding doors as illustrated.

The typical layout in figure 12 shows a possible interior arrangement within the unit. This design provides space for a large cooler with a freezer component inside, a dry storage area, and a cut-up room in addition to a small office. Refrigeration equipment should be installed to maintain temperatures of 32° F. in the cooler, and -10° within the walk-in freezer unit. The floors should be impervious to moisture and sloped to the drains as shown in figure 13. Each unit contains a total of 3,420 square feet of space.

Total floorspace to be occupied by the two

<sup>4</sup> U.S. DEPARTMENT OF AGRICULTURE, CONSUMER AND MARKETING SERVICE. U.S. INSPECTED MEAT PACKING PLANTS. A GUIDE TO CONSTRUCTION, EQUIPMENT, AND LAYOUT. U.S. Dept. Agr., Agr. Handb. 191, 77 pp. August 1969.

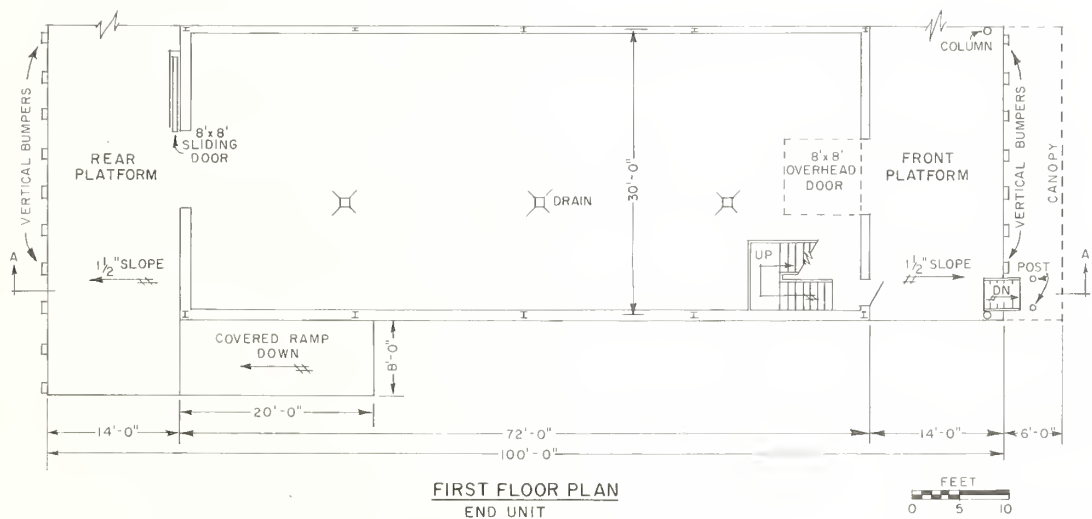
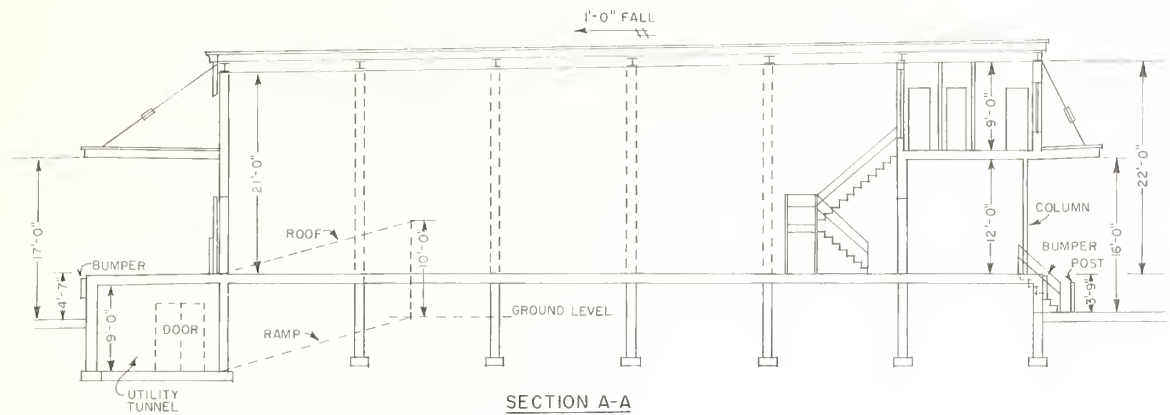


FIGURE 11.—Layout of a butter, margarine, cheese, and egg unit in a multiple-occupancy building. *Notes:* 1. The use of a utility tunnel is optional. Without the tunnel, refrigeration equipment could be located on the roof and utility lines along walls inside the building. 2. Buildings shown have support columns. Recent studies, completed during the writing of this report, indicate there would be little or no increase in cost to construct this building without support columns.

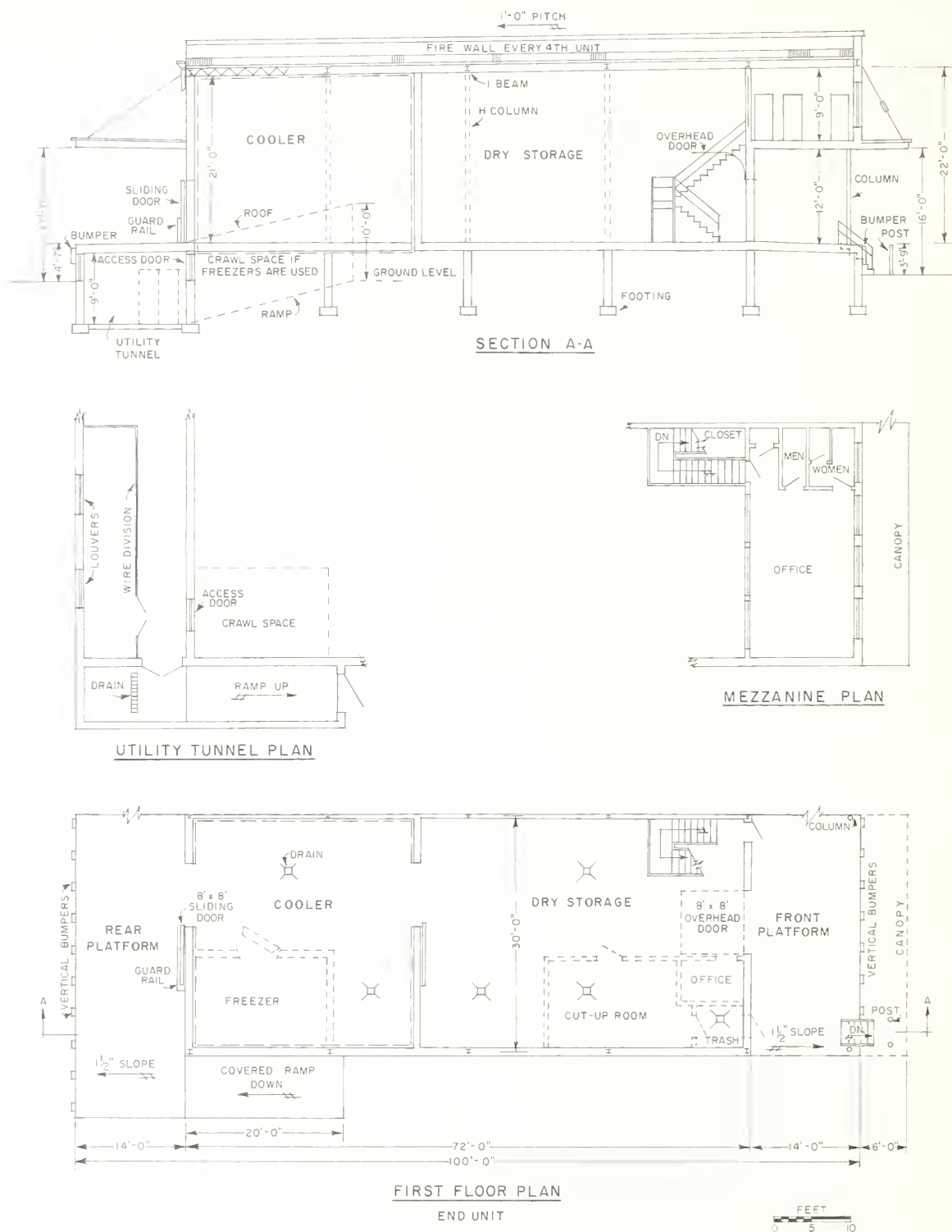


FIGURE 12.—Layout of a poultry unit in a multiple-occupancy building. *Notes:* 1. The use of a utility tunnel is optional. Without the tunnel, refrigeration equipment could be located on the roof and utility lines inside the building. 2. Buildings shown have support columns. Recent studies, completed during the writing of this report, indicate there would be little or no increase in cost to construct this building without support columns.



poultry dealers amounts to almost 7,000 square feet, or about 2 percent of the space shown in the master plan. Final plans for these new units should be submitted to the proper Federal, State, and local authorities. Facility requirements for Federal inspection may be found in a U.S. Department of Agriculture publication.<sup>5</sup>

### ***Fishery Products***

A small multiple-occupancy facility containing three units is proposed for the market's single fish and shellfish dealer. Each standard unit in this building is 30 feet wide and 86 feet deep with a 14-foot deep front platform. The overall facility depth is 100 feet. The ceiling slopes from 22 to 21 feet. A mezzanine area, office and storage area, 30 feet wide by 17 feet deep, is located at the rear of each unit. Other building characteristics are similar to the grocery units.

Since one firm will occupy all three units, it is recommended that partitions separating these units not be installed and that the interior of this facility be designed to meet specific requirements of the tenant, including refrigeration needs.

Space allocated for seafood operations in the proposed center is about 11,000 square feet, or 2 percent of the total planned.

### ***Refrigerated Warehouse***

The suggested master plan includes a public refrigerated warehouse, containing 86,000 square feet of space. An area of 43,000 square feet has been allocated for future expansion of the building. The structure should have a clear ceiling height of at least 21 feet with provisions for a 32° F. cooler, a -10° freezer; and a -40° blast freezer. For flexibility it would be advantageous to provide sufficient insulation in the cooler so that it could also function as freezer storage. Space requirements for one frozen food dealer should also be incorporated into this facility.

The rail platform of the warehouse should be 14 feet wide, and the truck receiving-shipping platform, 20 feet wide. Both platforms should be enclosed and insulated to maintain a temperature of 45° F. Office space can be constructed above the truck platform. Excess space over tenant needs could be rented to others in the market. The proposed refrigerated warehouse represents slightly more than 18 percent of the total floorspace planned for in the food center.

### **Additional Market Needs**

Market related office needs could be met by leasing either office space in the refrigerated warehouse or in existing buildings near the proposed center. Market functions requiring office space include the food center's management, banking firms, brokers, and contract shippers. A restaurant to serve the center should be located in either of the two multiple-occupancy buildings for fresh fruit and vegetable firms.

All major streets in the market should be paved to carry heavy traffic and to provide adequate drainage. Streets at least 200 feet wide are recommended where buildings face each other and center street parking is permitted. Other streets in the market should be at least 75 feet wide to allow two-way traffic. Parking areas should be convenient to the buildings but should not block the streets or loading and unloading areas. They should be marked for orderly parking at right angles.

Direct rail connections should be provided at the rear of the buildings for those expected to house tenants receiving food products by rail. Although rail service is not planned for all proposed facilities, the buildings should be aligned so that service could be extended if desired in the future. All trackage should be recessed in the pavement to permit truck access to rear platforms and for convenient cleaning and snow removal.

Flood lights are recommended for early morning work periods and for market security when the center is closed.

A central refrigeration system could be installed as an alternative to operating indi-

<sup>5</sup> U.S. DEPARTMENT OF AGRICULTURE. REGULATIONS GOVERNING THE INSPECTION OF POULTRY AND POULTRY PRODUCTS. Effective January 1, 1965. Code of Federal Regulations, title 7, ch. 1. subch. D., pt. 81. 1964.

vidually owned equipment. This could be accomplished either by designing a special facility to house the central refrigeration equipment or by increasing the capacity of the refrigerated warehouse's coolant system.

## **Acreage Required and Arrangement of New Facilities**

A master plan should be developed and approved at the outset of the project so that the first buildings constructed will not interfere with development of the remaining area.

The arrangement of facilities will depend on the physical features of the site selected. The location of access streets and rail tracks also influences building locations. If the proposed food center is to operate efficiently, the facilities must be arranged so that all future expansion will form an integral and coordinated part of the center. Wholesalers in each food group should be placed together, where possible, for maximum efficiency in construction and management. Space for expansion should be provided adjacent to each proposed structure.

Approximately 57 acres will be required for the facilities and expansion recommended in the master plan so that present and future marketing functions can be performed efficiently.

Figure 13 illustrates an arrangement of facilities that would be suitable on the stockyards site. This arrangement is intended to serve as a guide for firms that may become tenants in the new food distribution center. Buildings of similar size or shape should be aligned to avoid wasted space and to provide for the standard street widths recommended. The streets should be arranged to permit traffic to move smoothly through the food center. Good access from the food center to primary highways and streets is also important. Multiple-occupancy buildings should be located as near as possible to main market street entrances to reduce the traffic moving past other food facilities. This arrangement will also assist buyers who shop the market.

## ***Allied Expansion Area***

Additional land should be acquired to provide for food firms and allied industry not included in the initial planning. In other cities where distribution centers have been constructed, food wholesalers and other related industries have tended to locate adjacent to the initial development.

Therefore, an additional 25 acres of land should be obtained adjacent to the 57-acre tract presented in the master plan. This would bring the total land requirement for the food center and allied expansion areas to 82 acres. The additional 25 acres should be obtained at the same time the 57-acre tract is acquired or options be secured to purchase this additional land. Failure to do so can limit potential development of the market or result in excessive operating costs for prospective future tenants.

## **Site Selection**

Sites of sufficient size are extremely limited within the city limits of Denver except for land in the stockyards area just north of the downtown business district. Even though small parcels at another location might be consolidated the costs of acquisition and placing the land in condition to build probably would be prohibitive.

Sites in the outlying county areas are available but are less desirable because of their location, degree of development, or access to transportation facilities. Few are centrally located for deliveries to all sectors of the city.

City officials have indicated that redevelopment of land in the stockyards vicinity for an urban food distribution center would be consistent with both Platte River redevelopment proposals and the city's Comprehensive Denver Plan for the future. Therefore, this site was used in this study for developing plans for new food distribution facilities.

The stockyards area consists of a 129-acre tract, which includes properties of two former packing plants and the Denver Union Stock Yard Company (fig. 14). The tract is bounded on the northeast by the Riverside Cemetery; southeast by the Chicago, Burlington, and



FIGURE 13.—Suggested arrangement of facilities for a food distribution center on the stockyards site.



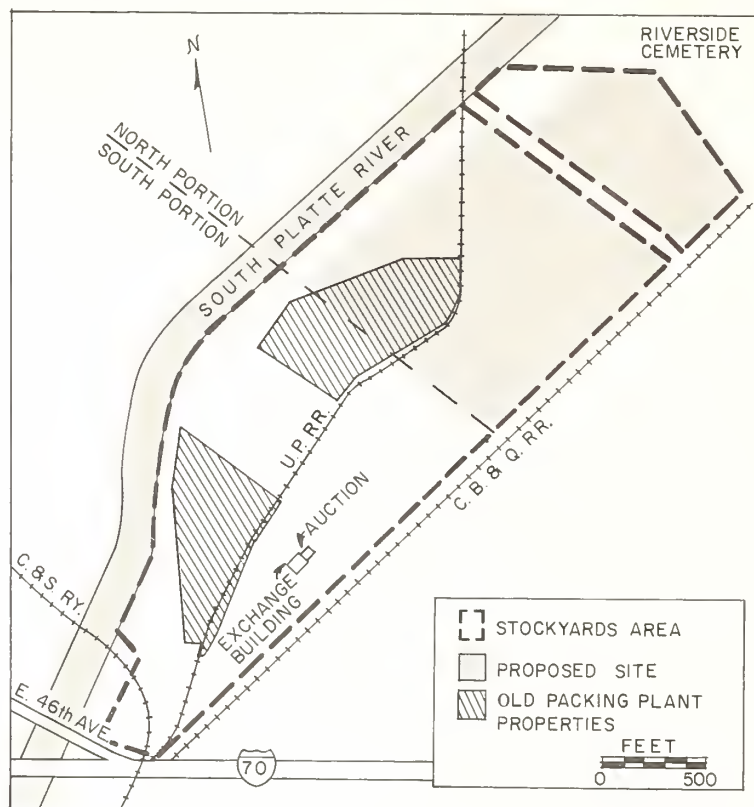


FIGURE 14.—Site of the proposed food distribution center.

Quincy mainline tracks; southwest by the Colorado and Southern tracks, Interstate Highway 70, and East 46th Avenue; and northwest by the Platte River. Some of the area in the north portion of the stockyard is no longer used. Therefore, a 50-acre parcel of land in this portion is available for alternative land uses. The area is clear, level land suitable for immediate construction. The remaining 7 acres of the proposed site, part of a former packing plant property, has some buildings on it, but these could be demolished easily. Interior plant equipment was removed when the property was sold and only the building shells remain.

The overall shape of the proposed site is basically rectangular and suitable for food distribution center development. An additional 25 acres bordering the site to the south and along the Platte River's east bank would be available for further expansion for other food firms and allied industry as the need arises.

All utilities including sewer lines are cur-

rently available on the 57-acre site and the general stockyards area has Industrial 2 zoning status. This means that the entire 129-acre tract is suitable for manufacturing, processing, storing, and wholesaling of any food commodity.

Existing railroad access is excellent. All six railroad firms serving Denver will be able to provide rail service, thereby saving at least one day's delivery time in contrast to many other Denver industrial locations.

Existing roadway approaches to the site are somewhat limited. Two narrow underpass structures, one at Race Court, the other at 47th Avenue and Lafayette Street, provide entrance into the yards area from the east under the Chicago, Burlington, and Quincy mainline tracks. The Lafayette Street entrance leads into an undefined internal street system within the stockyards area. Race Court extends across the north end of the site to Franklin Street which crosses the Platte River and provides

access from the north. Franklin Street extends north from the bridge to 58th Avenue in Adams County. The remaining access point is from the south of the stockyards area off East 46th Avenue.

The City's Comprehensive Denver Plan indicates the desirability of creating new approaches and correcting others to improve overall vehicle access and traffic circulation in the general stockyards area (see fig. 14). It is proposed that the Franklin Street-Race Court connection to Brighton Boulevard be improved, which will require widening underpass structures. To provide additional access, a new street is proposed midway through the stockyards area connecting with Brighton Boulevard on the east and bridging the Platte River to connect with North Washington Street on the west. This proposed route crossing the Platte River to North Washington Street may possibly connect with Interstate 25. A proposed Platte River Parkway, paralleling the river's channel path, would provide supplemental access as well as a circulation route with the stockyard complex.

Another local street within the site paralleling the Chicago, Burlington, and Quincy main-line tracks is also proposed. This street would connect Race Court with the proposed Platte River Parkway and would also intersect the proposed east-west access route. These proposed improvements would provide ample vehicle access and circulation for the stockyards site.

The site has convenient access to both Interstate highways 70 and 25 and is located less than 4½ miles from the center of population of the metropolitan area at 12th Avenue and Detroit Street. Arterial street connections off East 46th Avenue are quite good. In addition to being conveniently located for retailers, the site offers excellent intermarket access since it is located near several established chain warehouses serving the region. Access to air transport facilities is also good.

The cost of cleared, level land in the general vicinity of the stockyards varies with the size of the parcel. Sizable tracts suitable for most industrial purposes are estimated at 75 cents per square foot.

## ESTIMATED INVESTMENT COSTS

The initial investment for a proposed Denver food distribution center would involve two major components—land and facilities. The total estimated investment cost, cited in this section, is used as the basis for estimating the cost of debt service, taxes, and insurance and subsequent rentals required for the proposed development. *These costs are intended as guides and should not be substituted for firm proposals by contractors or architects.*

### Land

Land cost at the stockyard's site is estimated at 75 cents per square foot, or \$32,670 per acre. This cost is for land in condition to build. However, actual land value cannot be definitely determined until the center is approved and negotiations started to purchase the land.

### Facilities

Facility costs are based on construction indexes for Denver in late 1967 and estimates

made by local contractors.

Building cost estimates are for basic "light mill" type of construction. Multiple-occupancy building estimates include a mezzanine, or second floor; a stairway; toilets; fluorescent lighting fixtures; electrical outlets; platform lighting fixtures; and heating equipment. Multiple-meat unit estimates also include overhead meat rails and interior insulation. Tenants are assumed to finish their offices, install refrigeration, and satisfy their other interior requirements that depend upon individual firms needs and preferences. Estimated costs for single-occupancy facilities have similar features found in the multiple units such as toilets, lighting fixtures, and heating equipment. Refrigeration costs are not included except for those pertaining to the public cold storage facility.

Estimated costs associated with paving the market's streets and parking areas and installing sewers (sanitary and storm) are prorated

among the food groups according to their share of the total market. Rail tracks, switches, and floodlights are prorated to users. The cost of proposed access streets to the food center would be borne by State and city governments.

Service and loan fees included in the building costs are (1) a 6-percent architect's fee, (2) a 5-percent construction loan, including the architect's fee, and (3) a 10-percent con-

tingency cost.

## Total Investment Cost

The estimated costs of construction for the proposed facilities are shown in the following tabulations. A summary of the costs for land and construction for the food distribution center is shown by type of food firm or facility in table 9.

### Fresh Fruits and Vegetables

#### Multiple-occupancy facilities:

##### Building:<sup>1</sup>

2 buildings with 22 units each. 44 units with mezzanines (one unit used as a restaurant) and a utility tunnel under the rear platform—2,500 sq. ft. of 1st floor space @ \$10.03 per square feet (includes cost of mezzanine plus 350 sq. ft. of space under the rear platform), or \$25,075 per unit <sup>2</sup>	\$1,103,300
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Basement under the restaurant unit, 20 feet by 24 feet, with public toilet facilities, and served by a stairway	9,800
---	-------

Ramps at the end of each building (access to utility tunnels)	1,700
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##### Other facilities:

Trackage—3,470 linear ft. @ \$10.50 per ft. <sup>3</sup>	36,435
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Railroad switches—2 @ \$3,500 each <sup>3</sup>	7,000
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Paving (8-inch reinforced concrete)—44,673 sq. yd. @ \$4.50 per sq. yd.	201,029
---	---------

##### Sewers:

24-inch storm—2,100 linear ft. @ \$4.85 per ft.	10,185
---	--------

12-inch sanitary—1,400 linear ft. @ \$2.25 per ft.	3,150
--	-------

Floodlights—28 @ \$150 each	4,200
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Public address system	500
-----------------------	-----

Total construction cost of buildings and other facilities	<u>1,377,299</u>
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#### Associated construction costs:<sup>4</sup>

Architect's fee	82,638
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Construction loan	72,997
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Contingency allowance	153,293
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Total buildings, other facilities, and associated costs	<u>1,686,227</u>
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#### Single-occupancy facilities:

##### Building:<sup>1</sup>

1 building—25,000 sq. ft. @ \$9.75 per sq. ft.	\$ 243,750
--	------------

##### Other facilities:

Trackage—500 linear ft. @ \$10.50 per ft. <sup>3</sup>	5,250
--	-------

Railroad switches—1 @ \$3,500 each <sup>3</sup>	3,500
---	-------

Paving (8-inch reinforced concrete)—13,745 sq. yd. @ \$4.50 per sq. yd.	61,853
---	--------

##### Sewers:

24-inch storm—225 linear ft. @ \$4.85 per ft.	1,091
---	-------

12-inch sanitary—225 linear ft. @ \$2.25 per ft.	506
--	-----

Floodlights—6 @ \$150 each	900
----------------------------	-----

Total construction cost of building and other facilities	<u>316,850</u>
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#### Associated construction costs:<sup>4</sup>

Architect's fee	19,011
-----------------	--------

Construction loan	16,793
-------------------	--------

Contingency allowance	35,265
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Total building, other facilities, and associated costs	<u>387,919</u>
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Total investment costs of fresh fruits and vegetables facilities	<u>2,074,146</u>
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### Grocery Section

#### Multiple-occupancy facilities:

##### Building:<sup>1</sup>

1 building with 11 units, mezzanines included—3,000 sq. ft. 1st floor space @ \$9.75 per sq. ft. (includes cost of mezzanine), or \$29,250 per unit <sup>2</sup>	321,750
--	---------

##### Other facilities:

Trackage—800 linear ft. @ \$10.50 per ft. <sup>3</sup>	8,400
--	-------

Railroad switches—1 @ \$3,500 each <sup>3</sup>	3,500
---	-------

Paving (8-inch reinforced concrete)—13,890 sq. yd. @ \$4.50 per sq. yd.	62,505
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See footnotes at end of tabulations.



## Grocery Section—Continued

## Multiple-occupancy facilities—Continued

## Other facilities—Continued

## Sewers:

24-inch storm—600 linear ft. @ \$4.85 per ft.	2,910
12-inch sanitary—400 linear ft. @ \$2.25 per ft.	900

Floodlights—8 @ \$150 each	1,200
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Total construction cost of building and other facilities	401,165
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Associated construction costs:<sup>4</sup>

Architect's fee	24,070
-----------------	--------

Construction loan	21,262
-------------------	--------

Contingency allowance	44,650
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Total building, other facilities, and associated costs	491,147
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## Single-occupancy facilities:

Building:<sup>1</sup>

2 buildings—48,000 sq. ft. @ \$9.75 per sq. ft.	468,000
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## Other facilities:

Trackage—800 linear ft. @ \$10.50 per ft. <sup>3</sup>	8,400
--	-------

Railroad switches—2 @ \$3,500 each <sup>3</sup>	7,000
---	-------

Paving (8-inch reinforced concrete)—25,263 sq. yd. @ \$4.50 per sq. yd.	113,684
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## Sewers:

24-inch storm—600 linear ft. @ \$4.85 per ft.	2,910
---	-------

12-inch sanitary—500 linear ft. @ \$2.25 per ft.	1,125
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Floodlights—8 @ \$150 each	1,200
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Total construction cost of buildings and other facilities	602,319
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Associated construction costs:<sup>4</sup>

Architect's fee	36,139
-----------------	--------

Construction loan	31,923
-------------------	--------

Contingency allowance	67,038
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Total buildings, other facilities, and associated costs	737,419
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Total investment costs of grocery facilities	1,228,566
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## Meat and Meat Products

## Multiple-occupancy facilities:

Building:<sup>1</sup>

1 building with 16 units with a second floor and a utility tunnel under the front platform—2,500 sq. ft. of 1st floor space @ \$10.03 per sq. ft., \$1,800 per unit for second floor, and 350 sq. ft. of space under front platform, or \$26,875 per unit.	\$ 430,000
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Fire tower stairway, freight elevator, and shaft	73,000
--	--------

Grease traps—16 @ \$300 per unit	4,800
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Meat rails—16 units @ \$7,500 per unit	120,000
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Insulation—16 units with 5,600 sq. ft. per unit (1st floor only) @ \$3 per sq. ft.	268,800
--	---------

Ramp at the end of building (access to utility tunnel)	850
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## Other facilities:

Trackage—1,500 linear ft. @ \$10.50 per ft. <sup>3</sup>	15,750
--	--------

Railroad switches—1 @ \$3,500 each <sup>3</sup>	3,500
---	-------

Paving (8-inch reinforced concrete)—21,296 sq. yd. @ \$4.50 per sq. yd.	95,832
---	--------

## Sewers:

24-inch storm—1,075 linear ft. @ \$4.85 per ft.	5,214
---	-------

12-inch sanitary—425 linear ft. @ \$2.25 per ft.	956
--	-----

Floodlights—10 @ \$150 each	1,500
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Total construction cost of buildings and other facilities	1,020,202
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Associated construction costs:<sup>4</sup>

Architect's fees	61,212
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Construction loan	54,071
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Contingency allowance	113,549
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Total building, other facilities, and associated costs	1,249,034
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## Single-occupancy facilities:

Building:<sup>1</sup>

2 buildings 32,500 sq. ft. @ \$9.75 per sq. ft.	316,875
---	---------

## Other facilities:

Paving (8-inch reinforced concrete)—31,604 sq. yd. @ \$4.50 per sq. yd.	142,218
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## Sewers:

24-inch storm—550 linear ft. @ \$4.85 per ft.	2,668
---	-------

12-inch sanitary—450 linear ft. @ \$2.25 per ft.	1,012
--	-------

Floodlights—8 @ \$150 each	1,200
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Total construction cost of buildings and other facilities	463,973
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See footnotes at end of tabulations.

## Meat and Meat Products—Continued

## Single-occupancy facilities—Continued

Associated construction costs:<sup>4</sup>

Architect's fee	27,838
Construction loan	24,591
Contingency allowance	51,640
Total buildings, other facilities, and associated costs	568,042
Total investment costs of meat and meat products facilities	1,817,076

## Poultry, Butter, Margarine, Cheese, and Eggs Section

## Multiple-occupancy facilities:

Building:<sup>1</sup>

1 building with 3 units with mezzanines and a utility tunnel under the rear platform—3,000 sq. ft. of 1st floor space @ \$9.98 per sq. ft. (includes cost of mezzanine plus 350 sq. ft. of space under the rear platform), or \$29,940 per unit	89,820
Ramp at the end of the building (access to utility tunnel)	850

## Other facilities:

Paving (8-inch reinforced concrete)—3,073 sq. yd. @ \$4.50 per sq. yd.	13,829
Sewers:	
24-inch storm—225 linear ft. @ \$4.85 per ft.	1,091
12-inch sanitary—100 linear ft. @ \$2.25 per ft.	225
Floodlights—4 @ \$150 each	600
Total construction cost of building and other facilities	106,415

Associated construction costs:<sup>4</sup>

Architect's fee	6,385
Construction loan	5,640
Contingency allowance	11,844
Total buildings, other facilities, and associated costs	130,284

## Single-occupancy facilities:

Building:<sup>1</sup>

1 building—27,000 sq. ft. @ \$9.75 per sq. ft.	263,250
--	---------

## Other facilities:

Trackage—450 linear ft. @ \$10.50 per ft. <sup>3</sup>	4,725
Railroad switches—1 @ \$3,500 each <sup>3</sup>	3,500
Paving (8-inch reinforced concrete) 14,568 sq. yd. @ \$4.50 per sq. yd.	65,556
Sewers:	
24-inch storm—300 linear ft. @ \$4.85 per ft.	1,455
12-inch sanitary—200 linear ft. @ \$2.25 per ft.	450
Floodlights—6 @ \$150 each	900
Total construction cost of building and other facilities	339,836

Associated construction costs:<sup>4</sup>

Architect's fee	20,390
Construction loan	18,011
Contingency allowance	37,824
Total buildings, other facilities, and associated costs	415,061
Total investment costs of dairy and poultry facilities	546,345

## Fishery Products

## Multiple-occupancy facilities:

Building:<sup>1</sup>

1 building with 3 units with mezzanines and a utility tunnel under the rear platform—3,000 sq. ft. of 1st floor space @ \$9.98 sq. ft. (includes cost of mezzanine plus 350 sq. ft. under the front platform), or \$29,940 per unit <sup>2</sup>	89,820
Ramp at the end of building (access to utility tunnel)	850

## Other facilities:

Paving (8-inch reinforced concrete)—3,073 sq. yd. @ \$4.50 per sq. yd.	13,829
Sewers:	
24-inch storm—150 linear ft. @ \$4.85 per ft.	728
12-inch sanitary—75 linear ft. @ \$2.25 per ft.	169
Floodlights—3 @ \$150 each	450
Total construction cost of building and other facilities	105,846

Associated construction costs:<sup>4</sup>

Architect's fee	6,351
Construction loan	5,610
Contingency allowance	11,781
Total investment costs of fishery products facilities	129,588

See footnotes at end of tabulations.



## Refrigerated Warehouse

Building:<sup>1</sup>

1 building—86,000 sq. ft. with a 21-ft. ceiling height or 1,806,000 cu. ft. @ \$1 per cu. ft. (includes insulation and refrigeration equipment) -----	\$1,806,000
Ramp at the end of building (access to utility tunnel) -----	850

## Other facilities:

Trackage—1,000 linear ft. @ \$10.50 per ft. <sup>3</sup> -----	11,550
Railroad switches—1 @ \$3,500 each -----	3,500
Paving (8-inch reinforced concrete)—35,040 sq. yd. @ \$4.50 per sq. yd. -----	157,680
Sewers:	
24-inch storm—1,100 linear ft. @ \$4.85 per ft. -----	5,335
12-inch sanitary—475 linear ft. @ \$2.25 per ft. -----	1,069
Floodlights—10 @ \$150 each -----	1,500

Total construction cost of building and other facilities ----- 1,987,484

Associated construction costs:<sup>4</sup>

Architect's fee -----	119,249
Construction loan -----	105,337
Contingency allowance -----	221,207

Total investment costs of refrigerated warehouse facilities ----- 2,433,277

Grand total ----- 8,228,998

<sup>1</sup> The building cost estimates are based on brick and steel construction. The estimates are for the building only, excluding refrigeration requirements and interior equipment.

<sup>2</sup> Includes cost of mezzanine.

<sup>3</sup> Includes prorated shares of lead-in tracks and switches. The costs for tracks and switches are based on information supplied by local railroads.

<sup>4</sup> Associated construction costs are estimated as follows: Architect's fee, 6 percent of buildings and facilities cost; construction loan, 5 percent of buildings and facilities costs and architect's fee; and contingency allowance, 10 percent of buildings and facilities cost, architect's fee, and construction loan.

TABLE 9.—*Summary of estimated investment costs of land and proposed facilities for 65 independent food firms, Denver, 1966*<sup>1</sup>

Type of food firm or facility	Acreage required <sup>2</sup>	Estimated costs <sup>3</sup>		
		Land	Facilities	Total
	<i>Acres</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
Fresh fruits and vegetables <sup>4</sup> -----	16.2	529.3	2,074.1	2,603.4
Groceries -----	10.6	346.3	1,228.6	1,574.9
Meat and meat products -----	13.9	454.1	1,817.1	2,271.2
Butter, margarine, cheese, and eggs -----	4.3	140.5	459.5	600.0
Poultry -----	.6	19.6	86.8	106.4
Fishery products -----	.9	29.4	129.6	159.0
Refrigerated warehouse <sup>5</sup> -----	10.5	343.0	2,433.3	2,776.3
Total investment for proposed facilities -----	57.0	1,862.2	8,229.0	10,091.2

<sup>1</sup> Facility costs are based on Denver construction indexes for 1967.

<sup>2</sup> Land costs are based on estimates by local realtors, consultants, and city or State cooperating agencies.

<sup>3</sup> Rounded to nearest hundred dollars.

<sup>4</sup> Includes cost of 1 unit as a restaurant.

<sup>5</sup> Includes facilities for one frozen food firm.

## FINANCING AND OPERATING THE PROPOSED FOOD DISTRIBUTION CENTER

### Financing Methods

The proposed food distribution center should be operated in a manner that will promote marketing efficiencies within the industry since the center will function as a public service facility. The ultimate agency or group sponsoring construction of the market should provide assurances that: (1) The center will be properly located, designed and equipped; (2) a proper balance of land and facilities will be maintained to prevent overbuilding; (3) the new facilities will satisfy the tenant needs at the lowest possible rental costs; (4) the facilities will be utilized in the best interests of the public; and (5) the urban distribution center will be operated without discrimination against buyer, seller, or method of transportation.

There are several ways to finance and operate food distribution centers. Such urban projects have been handled in the past by private corporations, public benefit corporations, direct public ownership, or a combination of these methods.<sup>6</sup>

### *Private Corporations*

A private corporation may be operated as either a profit or nonprofit organization. When a private corporation is operated for profit, there are usually no restrictions on the sale of voting stock to any individual because of his occupation or profession, nor on the number of shares of stock that may be held by any one individual. Stockholders have one vote in corporate affairs for each share of voting stock held. Many food distribution centers are owned and operated by private corporations. In some of these centers, the principal stockholders are the tenants. In others, the corporation is a railroad firm or other nonfood oriented company. A major problem of corporate ownership involves the substantial financial equity which is

required. Private corporate sponsors sometimes find obtaining funds difficult as opposed to public market sponsors.

A nonprofit, private corporation must be organized in conformity with existing State statutes. As a rule, State statutes place no limitations on participation in the corporation because of business or occupation. However, membership may be restricted or limited through bylaws. In a nonprofit, private corporation, each stockholder member may be entitled to one vote or the bylaws may restrict ownership of voting stock to one share per member or base the voting rights on the amount of space on the cost of space used by each tenant. It is possible for those directly interested in the operation of a food center to form a nonprofit private corporation to finance and operate the food distribution center.

### *Public Benefit Corporations*

Public benefit corporations also called market authorities, offer some desirable features not found in other types of ownership. They differ from nonprofit, private corporations in that they are publicly owned.

A public benefit corporation is a nonprofit agency. Rentals and other charges do not exceed the costs of operation, including amortization of the original investment and maintenance of a contingency fund. Under public ownership the revenues would be considered public funds, and therefore, could not be paid to lessees as dividends. However, these funds might be appropriated for other public uses, unless such funds were specifically committed to redemption of the bonds and other expenses of the market.

Public market authorities usually have the power of eminent domain, which can be useful in the acquisition of a site. The authorities usually finance market improvements through the sale of revenue bonds. These bonds are often tax exempt; therefore, interest cost is lower. Other advantages of market authorities include the increased probability of land being available for future expansion and the possi-

<sup>6</sup> For detailed information on ownership and financing methods for urban food distribution facilities see: CLOWES, H. G., ELLIOTT, W. H., and CROW, W. C. WHOLESALE FOOD MARKET FACILITIES—TYPES OF OWNERSHIP AND METHODS OF FINANCING. U.S. Dept. Agr. Market Res. Rpt. 160, 96 pp. illus. 1957.

bility that the agency may not be required to pay local taxes.

However, market authorities do have certain limitations. Without sufficient equity money, they may find raising funds through revenue bonds difficult unless the bonds are guaranteed by a State, county, city, or other source. The continuity of management may often depend on the continuance of the administration in office. Market authorities in general do not have as much freedom of operation as possible under private ownership.

### ***Direct Public Ownership***

Direct State ownership and operation usually can be differentiated from a market authority by the methods of financing used and the delegation of authority established by the State legislature. Although some States can appropriate funds and otherwise assist market authorities, they usually do not underwrite the entire cost of a market constructed by an authority nor assume responsibility for the operation of the market.

Under direct State ownership the market center is financed in whole or in part by an appropriation of State funds. When a part of the total cost is not State financed, the State usually is obligated for the balance unless these funds are obtained through grants or donations. In addition, the State is responsible for maintenance and other expenses associated with market operations. States may finance, construct, and operate food market centers because the legislature feels that improved food distribution facilities will perform a public service by serving a community better.

Municipal ownership of a food distribution center is comparable in many ways to direct State ownership. If authorized, city councils or commissions may appropriate money from the city treasury to construct market facilities on a basis comparable to that of a State legislature. Three methods usually open to financing a market under a municipal program are (1) issuing municipal bonds, (2) issuing revenue warrants, and (3) obtaining loans from public corporations. In most cities the issuance of bonds for such construction must be approved by a majority of voters in a referendum.

### ***Combinations***

Because of the complexity of establishing large urban food distribution centers, these facilities are sometimes financed in part by both public and private agencies. Recent construction of a food center in the Northeast typifies the possibilities of various combinations.

In Philadelphia, a food distribution center was built partly by a nonprofit corporation on land owned and put in condition for building by the city, and partly by private corporations financing the construction of their own facilities on land acquired from the city. The city subordinated its interest in the land so that the land could be used as equity in borrowing funds for construction. After the multiple-occupancy buildings were constructed, the development company leased the units to operating stock companies formed by prospective tenants. At the end of 30 years, all building units will become the property of the city, except those single-occupancy units developed and built with private funds.

Financial and organizational methods used to develop a Metropolitan Denver food distribution center must be determined by city officials, financiers, and food wholesalers.

### ***Estimated Operational Costs***

The following estimates illustrate the probable operating costs for the proposed market if it were financed through a nonprofit, private corporation without subsidy. These estimates are not intended to imply that other financial arrangements are not as desirable and, therefore, should not be considered. The actual operating costs could vary substantially from these estimates if a financing method with subsidies is selected. Annual operating expenses and revenue requirements for the proposed facilities include (1) debt service on the investment in land and facilities, (2) real estate taxes, and (3) management maintenance expenses.

### ***Debt Service***

The food distribution center should be financed so that it will be a self-sustaining entity. The major operational cost is debt



service, or amortization, which, of course, is the payment for the facilities. Payments for loan retirement must be derived from market revenues and adequate standards for these installments must be enforced. The recommended facilities for the food center should not become obsolete in less than 25 years and have a useful life extending far beyond this period. With minor alteration, these facilities could be converted for use by other occupants.

Funds required to finance the distribution center could be obtained from three principal sources: (1) First mortgage bonds; (2) second mortgage bonds or preferred stock; and (3) equity capital. In general, about 65 percent might be obtained from a first mortgage and 20 to 25 percent on a second mortgage, or a corporation issuance of preferred stock. The remaining 10 to 15 percent could come from equity capital. Since a financial plan has not

been developed, precise loan terms cannot be determined. An average interest rate of 6½ percent amortized over 25 years was assumed, but actual costs would depend on interest charges at the time market sponsors financed the project. Because of unstable interest rates at the time this study was made, rates could not be estimated that might be in effect when the facilities are built. The assumed rates used, for calculating debt service in this report are those which have prevailed over a fairly long period of time.

Escrow requirements to guarantee loan repayment would be equivalent to one year's loan installment or approximately \$827,000. This sum could be borrowed as part of the initial loan and invested in an approved savings institution or U.S. Treasury bonds with accumulated interest applied to amortization of the loan. At the assumed interest rate and amorti-

TABLE 10.—*Estimated annual income required for operation of the proposed food distribution center for Denver, 1966*

Type of food firm or facility	Debt service			Real estate taxes			Manage- ment and mainte- nance <sup>5</sup>	Total revenue require- ments
	Amorti- zation charge <sup>1</sup>	Amortiza- tion of escrow account <sup>2</sup>	Total	Taxes <sup>3</sup>	Reserve <sup>4</sup>	Total		
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars
Fresh fruits and vegetables <sup>6</sup> ----	213.4	9.0	222.4	56.3	5.6	61.9	39.6	323.9
Groceries -----	129.1	5.5	134.6	34.0	3.4	37.4	24.0	196.0
Meat and meat products -----	186.2	7.9	194.1	49.1	4.9	54.0	34.6	282.7
Butter, margarine, cheese, and eggs -----	49.2	2.1	51.3	13.0	1.3	14.3	9.1	74.7
Poultry -----	8.7	.4	9.1	2.3	.2	2.5	1.7	13.3
Fishery products -----	13.1	.5	13.6	3.4	.3	3.7	2.4	19.7
Refrigerated warehouse <sup>7</sup> -----	227.6	9.6	237.2	60.0	6.0	66.0	42.2	345.4
Total -----	827.3	35.0	862.3	218.1	21.7	239.8	153.6	1,255.7

<sup>1</sup> Based on 6½ percent per year over 25 years for the total investment cost of land and facilities, or an annual cost of \$81.98 per \$1,000.

<sup>2</sup> At an annual interest rate of 6½ percent amortized over 25 years, the annual cost of the \$827,000 escrow account would be approximately \$68,000. This would be partially offset by earnings of the invested escrow account, assumed to return about 4 percent annually, or about \$33,000. Thus, the new escrow payment required would be \$35,000.

<sup>3</sup> Based on total investment in land and facilities.

<sup>4</sup> 10 percent of payment to cover possible increases in tax rates.

<sup>5</sup> Prorated on the basis of each group's relative value towards the entire investment.

<sup>6</sup> Includes one unit as a restaurant.

<sup>7</sup> Includes facilities for a frozen food firm.



zation period, the annual cost of the escrow fund would be approximately \$68,000. This sum could be partly offset by earnings of about \$33,000 from interest paid on the escrow account which is assumed to be 4 percent. Therefore, the net cost of this fund would be about \$35,000 per year. Based on these assumptions, annual revenue requirements for debt service would amount to approximately \$862,000 at the stockyards site (table 10).

### Real Estate Taxes

Another large expense in market operation under private financing would include taxes on real property and improvements. Assessed valuation for the stockyards site in 1967 was 30 percent of the estimated property value and the tax rate was \$72.04 per \$1,000 assessed valuation. This is the basis upon which taxes are computed. Since tax rates probably will rise in future years, a contingency tax reserve of 10 percent has been included in the cost. Estimated annual real estate taxes would be \$239,800 (table 10).

### Management and Maintenance

Management expenses include salaries for the food center's manager and his staff; legal, and auditing fees; office rental; costs for office equipment and supplies; advertising and promotional fees; business and travel expenses; and communication-utility charges. Maintenance costs include street cleaning, snow removal, repairs and upkeep, and insurance. Cost estimates were based on actual operating costs for food centers in other cities, and existing service charges in Metropolitan Denver where applicable. To offset a possible increase in these costs, a 10 percent contingency reserve was included. Annual management and maintenance operating costs for the food center are estimated as follows:

#### Management:

##### Salaries:

Market manager .....	\$ 14,000
Secretary .....	5,500

##### Associated expenses:

Bookkeeping services .....	4,000
Legal and auditing services .....	2,500
Advertising and promotion .....	2,500

Travel and business expenses .....	2,000
Office rental .....	2,400
Office equipment and supplies .....	1,500
Janitorial services .....	2,100
Telephone and other communications .....	700
Utilities (management office and public areas) .....	3,000
Maintenance:	
Security .....	8,400
Insurance: liability, fire, and extended coverage .....	20,500
Street cleaning and snow removal .....	20,000
General maintenance <sup>1</sup> .....	50,500
Contingency <sup>2</sup> .....	13,960
Total costs .....	\$153,560

<sup>1</sup> Based on 0.75 percent of investments in facilities.

<sup>2</sup> 10 percent of total cost.

### Estimated Rental Requirements

Total annual revenue needed to finance and operate the proposed food center is estimated at \$1.3 million (table 10). It is assumed that this revenue will be derived from rental charges of facilities. Rental requirements per square foot of building space have been estimated for each commodity group and for the

TABLE 11.—*Estimated annual facility rentals in the proposed food distribution center for Denver, 1966* <sup>1</sup>

Type of food firm or facility	Total building area allocated	Rental requirements per square foot <sup>2</sup>
	1,000	
Fresh fruits and vegetables:	square feet	Dollars
Firm facilities .....	148	2.15
Restaurant .....	3	2.30
Total or average .....	151	2.15
Groceries .....	87	2.25
Meat and meat products .....	101	2.80
Butter, margarine, cheese and eggs .....	30	2.50
Poultry .....	7	1.90
Fishery products .....	11	1.80
Refrigerated warehouse <sup>3</sup> .....	86	4.00
Grand total or average .....	473	2.65

<sup>1</sup> Based on annual revenue requirements shown in table 10.

<sup>2</sup> Rounded to nearest 5 cents.

<sup>3</sup> Includes facilities for a frozen food firm.

refrigerated warehouse (table 11). All costs are exclusive of individual firm requirements.

These annual rental charges are based on the total building costs and space planned for each commodity group and the refrigerated warehouse without differentiation between sug-

gested single- and multiple-occupancy facilities. No provisions have been made to permit vacancies during the loan retirement period. Therefore, long-term leases should be obtained from tenants before construction of the food center to prevent vacancies or overbuilding.

## ESTIMATED SAVINGS AND BENEFITS FROM IMPROVED FACILITIES

### Measurable Savings

Savings derived from operating efficiencies in the proposed food center were estimated for 61 of the 65 independent firms for whom new facilities have been recommended. Savings for the remaining firms are not shown to avoid disclosure of individual firm data.

No measure of savings was determined for the recommended public refrigerated warehouse since cold storage operators were not included in the survey.

The estimated handling and other costs in the proposed facilities are based upon previous research by the Department on operating costs when efficient handling techniques are used in conjunction with modern food distribution facilities. These data are used to indicate the savings between the average cost of operations in the existing facilities and those in proposed facilities.

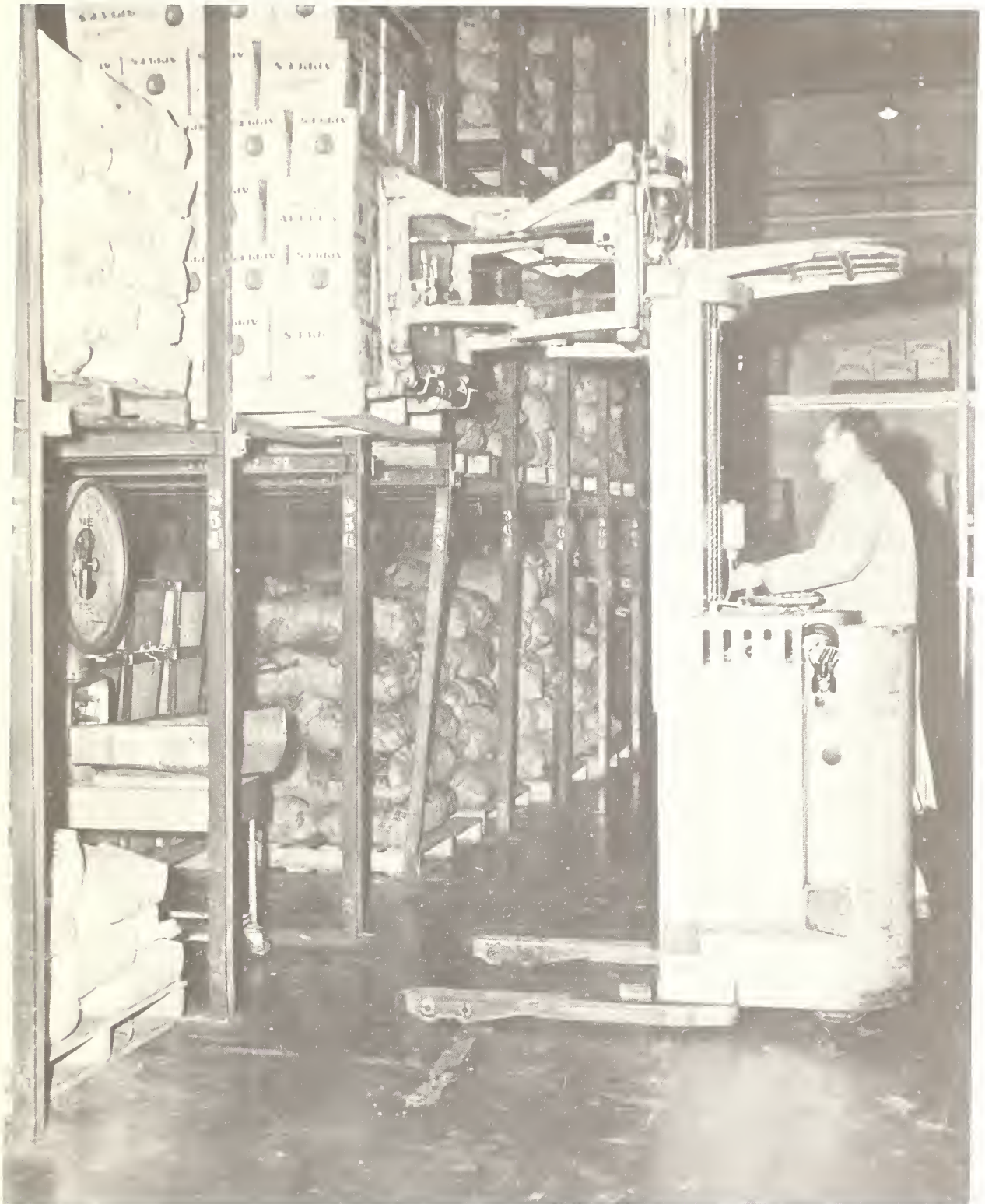
Direct rail service to buildings would reduce cartage costs. Wide streets and adequate parking areas should reduce traffic congestion and eliminate avoidable truck delays. One-level buildings with floors at truck and railcar floor level would provide for efficient receiving, handling, and shipping operations. Inventory control would also be improved in one-level facility. Continuous platforms on the multiple-occupancy buildings should substantially reduce interdealer transfer costs. Firms could expect to benefit directly by obtaining more usable space and improved working conditions.

Handling costs could be reduced through proper use of modern materials-handling equipment and the unit-load principle (fig. 15). Good interior layouts could provide efficient product flow and space utilization, as an in-

tegral part of the market's modern handling methods program. Such improvements would also reduce processing costs for meat firms included in the analysis. Overall labor efficiency increases could contribute significantly to potential savings. With less handling required, breakage, bruising, and subsequent spoilage would be reduced. Therefore, waste and deterioration losses could be reduced at a new food center. Pilferage could also be reduced since temporary outside storage would be unnecessary.

However, some operating costs associated with the proposed distribution center would increase. Improved labor efficiency and space utilization depend on the use of efficient mechanized methods. Equipment costs would rise because of higher ownership and operating costs than that of equipment presently used. Rents would also be higher because land and construction costs are higher today than when the existing facilities were built. But the food distribution center would contain facilities and services not generally available to many food firms today. Higher rent is the price that must be paid for reductions in other marketing costs, more usable space, improved working conditions, better maintenance of product quality, and an improved competitive position. The proposed market would also provide additional land for future expansion of facilities.

The distribution costs at the proposed food center could be lower than that at existing markets because of traffic congestion and the central location of the stockyards site. Good accessibility to major express highways from the site would reduce avoidable delays considerably. Immediate rail access would also help.



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FIGURE 15.—Handling costs reduced through use of three-tiered pallet rack systems and unit loads.



Part of the estimated savings in distribution reflect the use of a delivery pool system for those firms who typically deliver small orders in trucks operated below normal capacity. No comparisons of costs were made for out-of-State distribution points, but savings would probably result for firms dealing with such accounts.

A summary of estimated annual savings is shown in table 12. A breakdown of these estimated marketing costs is presented in appendix table 14.

Projected savings are not uniform for all types of food firms included in the analysis. The 61 firms as a group could expect annual savings of about \$682,000 in receiving, handling, and distributing costs through improved efficiency. However, not all these savings could be retained since rents and equipment costs would increase. After these expenses are paid, about \$100,000 would remain as annual savings. However, if operating expenses continue to rise, the anticipated savings measured in this study may be much greater in the future.

Improved efficiencies incorporated into the proposed food center could be expected to help hold down future operating costs in the presence of greater volumes and rising material and labor costs.

### Other Benefits

Other benefits that cannot be measured in dollars result from a modern, efficient food center. These benefits are intangible and would accrue not only to the food firms located in the food center, but also to local processors and producers, buyers, transportation agencies, market employees, the city, and consumers.

Firms in the center could regulate working hours and enjoy a better work environment. Streamlined operations and modern facilities in a new food center could improve the prestige of the food commodity business. Joint promotions could be undertaken. Prior sales lost through a firm's inability to serve customers properly could likely be regained.

Local processors and producers could also expect benefits that are not self-evident. A

TABLE 12.—*Estimated annual costs in present and proposed facilities and potential savings for 61 food firms, Denver, 1966*<sup>1</sup>

Type of food firm	Volume handled <sup>2</sup>	Total selected costs <sup>3</sup>		Ratio of proposed costs to present costs	Savings
		Present	Proposed		
	<i>Tons</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>Percent</i>	<i>1,000 dollars</i>
Fresh fruits and vegetables	121,194	1,264.7	1,308.0	103.4	-43.3
Groceries	32,849	568.7	610.7	107.4	-42.0
Meat and meat products	34,865	3,520.3	3,374.0	95.8	146.3
Butter, margarine, cheese, and eggs	21,091	429.2	389.3	90.7	39.9
Poultry <sup>4</sup>	--	--	--	--	--
Frozen foods and fishery products <sup>4</sup>	--	--	--	--	--
Total	<sup>5</sup> 217,261	5,782.9	5,682.0	98.3	100.9

<sup>1</sup> Estimates are based on 61 of the 65 food firms planned for in the proposed center. See appendix table 14.

<sup>2</sup> Estimated tonnages handled by those firms relocating.

<sup>3</sup> Includes selected costs for moving products to wholesalers' facilities, handling within the facilities, and distributing to outlets within the State.

<sup>4</sup> Not shown to avoid disclosure of confidential data.

<sup>5</sup> Includes receipts for poultry, frozen foods, and fishery products.



central purchasing area where firms congregate induces competition and the assurance that the best possible prices will be obtained for their products. Elimination of inefficient features in existing facilities could tend to pass some savings back to processors and producers as higher prices.

Buyers at the proposed food center could expect to gain in various ways. They could examine and select products more efficiently since they would not have to visit several market areas to complete their orders. They would be able to arrive at the center and park, make their selections, have their trucks loaded rapidly, and leave without unnecessary delays. An efficient order assembly-delivery system would be available for those not desiring to carry their supplies with them. A modern food center could also lead to a better informed buying group with improved knowledge of current prices and available supplies.

Transportation agencies could serve food firms more effectively and at less cost. Many food firms in the area today are not located near rail facilities, and therefore, are unable to receive direct rail shipments. Proposed rail facilities at the distribution center would encourage food firms to use rails for shipments. Trucking firms hauling food products to and from the proposed center could also provide

improved service since traffic delays and inadequate parking would be eliminated.

With improved working conditions at the center, employee morale would be higher and probably result in greater work productivity. Jobs would become less strenuous and more productive through the use of modern handling equipment. Other improvements which would benefit employees are ample parking, restaurants, and modern welfare facilities.

Denver urban renewal programs would be assisted by the establishment of a food center since displaced food firms would have an area in which to relocate. Freeing downtown land areas where existing facilities are located would enable city planning agencies to proceed with their redevelopment programs. Higher land use made of the depressed downtown areas would eventually provide higher tax revenues and, thereby establish a more equitable tax structure for city real estate. Other benefits include economies in the city's enforcement of fire, health, and sanitary codes for firms as well as the elimination of market traffic which contributes to commuter delays during rush hour periods.

Consumers in the metropolitan area and others in Colorado served by firms at the proposed distribution center could expect to benefit by receiving food in better condition.

## CONCLUSIONS

This study of food marketing facilities and practices within the Metropolitan Denver area has led to the overall conclusion that constructing a modern food distribution center as a regional market to replace present inefficient and out-moded facilities would be economically feasible, and that food dealers and others in Colorado would benefit. This conclusion, however, is contingent upon the proposed market being constructed within the framework of the following qualifications:

(1) It is built at a convenient location with unrestricted receiving and distribution.

(2) The facilities to be included, the amount of land needed, and the requisites for the site are in accordance with the findings of this

study and caution is used in scheduling construction of buildings and occupancy of tenants who would move in now or later.

(3) A master plan is prepared and adopted at the outset, so that the first buildings constructed will not interfere with the complete development of the center.

(4) Market plans are coordinated with plans of all city planning agencies that might be involved, including plans for redevelopment of blighted areas, future location of major expressways and other transportation arteries, and other facilities now planned or under construction.

(5) An effective sponsoring group is established to implement the findings of this study.

## APPENDIX

TABLE 13.—Estimated annual costs of moving products through present facilities of 104 independent food firms, Denver, 1966

Cost item	Fresh fruits and vegetables			Groceries			Meat and meat products			Butter, margarine, cheese, and eggs		
	Volume <sup>1</sup>	Cost per ton <sup>2</sup>	Total cost	Volume <sup>1</sup>	Cost per ton <sup>2</sup>	Total cost	Volume <sup>1</sup>	Cost per ton <sup>2</sup>	Total cost	Volume <sup>1</sup>	Cost per ton <sup>2</sup>	Total cost
	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars
Moving commodities to dealers' facilities:												
Cartage <sup>3</sup>	1,589	3.52	5.8	989	3.03	3.0	149	3.36	0.5	--	--	--
Receipts without cartage	130,811	--	--	81,453	--	--	74,421	--	--	25,832	--	--
Avoidable delay to inbound trucks	(7,563)	.13	1.0	(1,649)	.18	.3	(3,356)	.21	.7	(8,975)	0.03	0.3
Total receipts	132,400	.05	6.6	82,442	.04	3.3	74,570	.02	1.2	25,832	.01	.3
Handling within the markets:												
Labor:												
Unloading at facilities	132,400	.72	95.3	82,442	1.11	91.5	74,570	3.25	242.4	25,832	1.44	37.2
Interdealer transfers	(36,478)	2.35	85.7	(6,588)	6.05	39.9	(13,159)	6.60	86.8	(3,031)	5.31	16.1
Handling within stores	(168,878)	1.23	207.7	(89,030)	3.47	308.9	(87,729)	57.20	5,018.1	(28,863)	4.26	123.0
Loading out to trucks	(168,878)	.87	146.9	(89,030)	2.10	187.0	(87,729)	4.47	392.1	(28,863)	1.97	56.9
Total labor	(168,878)	3.17	535.6	(89,030)	7.05	627.3	(87,729)	65.42	5,739.4	(28,863)	8.08	233.2
Other costs:												
Public warehouse service charges <sup>(5)</sup>				(1,327)	5.80	7.7	(27,812)	9.69	269.5	(2,293)	9.29	21.3
Use of handling equipment	(168,878)	.05	8.4	(89,030)	.56	49.8	(87,729)	.53	46.5	(28,863)	.30	8.7
Rent	(168,878)	1.00	168.9	(89,030)	2.50	222.5	(87,729)	4.53	397.4	(28,863)	3.08	88.9
Facility services	(168,878)	.44	74.3	(89,030)	.68	60.5	(87,729)	6.42	563.2	(28,863)	2.72	78.5
Waste, thefts, and deterioration <sup>6</sup>	(132,400)	.93	123.1	(82,442)	(*)	(*)	(74,570)	2.86	213.3	(25,832)	.71	18.3
Total other costs	132,400	2.83	374.7	82,442	4.13	340.5	(74,570)	19.98	1,489.9	25,832	8.35	215.7
Total selected handling costs within the market	132,400	6.88	910.3	82,442	11.74	967.8	(74,570)	96.95	7,229.3	25,832	17.38	448.9
Distributing commodities:												
Within Metropolitan Denver	92,018	3.19	293.5	47,239	4.20	198.4	36,092	6.11	220.5	16,326	3.49	57.0
Outside Metropolitan Denver but within Colorado	14,167	12.04	170.6	24,568	10.54	259.0	6,115	17.09	104.5	5,347	10.79	57.7
Total distribution within Colorado	106,185	4.37	464.1	71,807	6.37	457.4	42,207	7.70	325.0	21,673	5.29	114.7
Outside Colorado	26,215	(*)	(*)	10,635	(*)	(*)	32,363	(*)	(*)	4,159	(*)	(*)
GRAND TOTAL	132,400	10.43	1,381.0	82,442	17.33	1,428.5	74,570	101.32	7,555.5	25,832	21.83	563.9

Cost item	Poultry		Frozen foods and fishery products			All food firms		
	Volume <sup>1</sup>	Cost per ton <sup>2</sup>	Total cost	Volume <sup>1</sup>	Cost per ton <sup>2</sup>	Total cost	Cost per ton <sup>2</sup>	Total cost
	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars	Dollars	1,000 dollars
Moving commodities to dealers' facilities:								
Cartage <sup>3</sup>	--	--	--	207	5.80	1.2	2,934	3.51
Receipts without cartage	21,604	--	--	10,711	--	--	344,832	--
Avoidable delay to inbound trucks	( <sup>4</sup> )	( <sup>4</sup> )	--	( <sup>4</sup> )	( <sup>4</sup> )	--	(21,543)	0.11
Total receipts	21,604	--	--	10,918	.11	1.2	347,766	.03
Handling within the markets:								
Labor:								
Unloading at facilities	21,604	0.85	18.4	10,918	1.15	12.6	347,766	1.43
Interdealer transfers	(668)	2.25	1.5	--	--	--	(59,924)	3.84
Handling within stores	(22,272)	2.20	49.0	(10,918)	2.41	26.3	(407,690)	14.06
Loading out to trucks	(22,272)	1.22	27.2	(10,918)	1.71	18.7	(407,690)	2.03
Total labor	(22,272)	4.31	96.1	(10,918)	5.28	57.6	(407,690)	17.88
Other costs:								
Public warehouse service charges	(1,953)	11.06	21.6	(526)	13.31	7.0	(33,911)	9.65
Use of handling equipment	(22,272)	.32	7.1	(10,918)	.74	8.1	(407,690)	.32
Rent	(22,272)	2.77	61.7	(10,918)	6.05	66.1	(407,690)	2.47
Facility services	(22,272)	3.54	78.8	(10,918)	1.74	19.0	(407,690)	2.14
Waste, thefts, and deterioration <sup>5</sup>	(21,604)	( <sup>4</sup> )	( <sup>4</sup> )	(10,918)	1.29	14.1	(347,766)	1.06
Total other costs	21,604	7.83	169.2	10,918	10.47	114.3	347,766	7.78
Total selected handling costs within the market	21,604	12.28	265.3	10,918	15.74	171.9	347,766	28.74
Distributing commodities:								
Within Metropolitan Denver	14,367	3.25	46.7	8,931	6.29	56.2	214,973	4.06
Outside Metropolitan Denver but within Colorado	2,117	4.82	10.2	1,638	16.73	27.4	53,952	11.67
Total distribution within Colorado	16,484	3.45	56.9	10,569	7.91	83.6	268,925	5.58
Outside Colorado	5,120	( <sup>6</sup> )	( <sup>7</sup> )	349	( <sup>6</sup> )	( <sup>7</sup> )	78,841	( <sup>7</sup> )
GRAND TOTAL	21,604	14.91	322.2	10,918	23.51	256.7	347,766	33.09

<sup>1</sup> Figures in parentheses are duplicated in other items. <sup>2</sup> Rounded to the nearest cent. <sup>3</sup> Includes cartage from team tracks and the airport. <sup>4</sup> Negligible amounts. <sup>5</sup> Not shown to avoid disclosure of confidential data. <sup>6</sup> The bulk of most of these costs resulted from avoidable spoilage. <sup>7</sup> Cost of distribution to points outside Colorado not computed.



TABLE 14.—Estimated annual costs and savings of moving products through the facilities of 61 independent food firms expected to move into the proposed food distribution center, Denver, 1966<sup>1</sup>

Cost item	Fresh fruits and vegetables				Groceries			
	Volume in proposed market <sup>2</sup>	Cost in present market	Cost in proposed market		Volume in proposed market <sup>2</sup>	Cost in present market	Cost in proposed market	
			Average per ton	Total			Average per ton	Total
Moving commodities to dealers' facilities:								
Cartage	Tons 1,454	1,000 dollars 6.0	Dollars 0.83	1,000 dollars 1.2	Tons 394	1,000 dollars 31.3	Dollars 0.76	1,000 dollars 0.3
Receipts without cartage	119,740				32,455			
Total receipts	121,194	6.0	.01	1.2	32,849	1.3	.01	.3
Handling within the market:								
Labor:								
Unloading at facilities	121,194	87.2	.60	72.7	32,849	36.4	.70	23.0
Interdealer transfers	33,450	78.6	1.50	50.2	2,628	15.9	4.20	11.0
Handling within stores	154,644	190.2	.35	131.4	35,477	123.1	2.70	95.8
Loading out to trucks	154,644	134.5	.70	108.3	35,477	74.5	1.05	37.3
Total labor	154,644	490.5	2.34	362.6	35,477	249.9	4.71	167.1
Other costs:								
Public warehouse service charges	5				526	3.1	2.32	1.2
Use of handling equipment	154,644	7.7	.17	26.3	35,477	19.9	.98	34.8
Facility services	154,644	68.0	.31	47.9	35,477	24.1	.48	17.0
Waste, theft and deterioration	121,194	112.7	.47	57.0	32,849	4		7.1
Total other costs	121,194	188.4	1.08	131.2	32,849	47.1	1.61	53.0
Total selected handling costs within the market <sup>3</sup>	121,194	678.6	4.07	493.8	32,849	297.0	6.70	220.1
Total selected costs associated with moving commodities to and handling within the market <sup>4</sup>								
Rental of facilities	121,194	684.9	4.08	495.0	32,849	298.3	6.71	220.4
	154,644	155.0	2.67	412.9	35,477	88.1	5.97	211.8
Distributing commodities:								
Within Metropolitan Denver	84,230	268.7	2.97	250.2	18,822	79.1	4.33	81.5
Outside Metropolitan Denver but within the State of Colorado	12,968	156.1	11.56	149.9	6.2	9,789	103.2	97.0
Total distribution within Colorado	97,198	424.8	4.12	400.1	24.7	28,611	182.3	178.5
Outside Colorado <sup>5</sup>	23,996				4,238			
Total distribution	121,194	424.8	3.30	400.1	24.7	32,849	182.3	178.5
GRAND TOTAL	121,194	1,264.7	10.79	1,308.0	-43.3	32,849	568.7	610.7



Cost item	Meat and meat products				Butter, margarine, cheese, and eggs				All food firms			
	Volume in proposed market <sup>2</sup>	Cost in present market	Cost in proposed market		Volume in proposed market <sup>2</sup>	Cost in present market	Cost in proposed market		Volume in proposed market <sup>2</sup>	Cost in present market	Cost in proposed market	
			Average per ton	Total			Average per ton	Total			Average per ton	Total
Moving commodities to dealers' facilities:		1,000 Dollars	Dollars	1,000 dollars		1,000 dollars	Dollars	1,000 dollars		1,000 dollars	dollars	1,000 dollars
Cartage	70	30.6	...	0.6	...	30.2	...	0.2	1,918	38.1	...	1.5
Receipts without cartage	34,795	...	...	...	...	21,091	...	...	208,081	...	...	6.6
Total receipts	34,865	6	...	6	...	21,091	2	...	209,999	8.1	(*)	6.6
Handling within the market:												
Labor:												
Unloading at facilities	34,865	113.3	2.60	90.6	22.7	21,091	30.4	1.05	22.1	8.3	209,999	267.3
Interdealer transfers	6,136	40.5	5.30	32.5	8.0	2,468	13.1	3.45	8.5	4.6	44,682	148.1
Handling within stores	41,001	2,345.3	54.35	2,228.4	116.9	23,559	100.4	3.20	75.4	25.0	254,681	2,759.0
Loading out to trucks	41,001	183.3	3.60	147.6	35.7	23,559	46.4	1.45	34.2	12.2	254,681	438.7
Total labor	41,001	2,682.4	60.95	2,499.1	183.3	23,559	190.3	5.95	140.2	50.1	254,681	3,613.1
Other costs:												
Public warehouse service												
charges	13,005	126.0	5.81	75.6	50.4	1,877	17.4	3.72	7.0	10.4	15,408	146.5
Use of handling equipment	41,001	21.7	1.59	65.2	-43.5	23,559	7.1	.60	14.1	-7.0	254,681	56.4
Facility services	41,001	263.2	4.49	184.1	79.1	23,559	64.1	1.90	44.8	19.3	254,681	419.4
Waste, theft and deterioration	34,865	99.7	1.43	49.9	49.8	21,091	15.0	.36	7.6	7.4	209,999	227.4
Total other costs	34,865	510.6	10.75	374.8	135.8	21,091	103.6	3.48	73.5	30.1	209,999	849.7
Total selected handling costs within the market <sup>5</sup>	34,865	3,193.0	82.43	2,873.9	319.1	21,091	293.9	10.13	213.7	80.2	209,999	4,462.8
Total selected costs associated with moving commodities to and handling within the market <sup>6</sup>	34,865	3,193.6	82.43	2,873.9	319.7	21,091	294.1	10.13	213.7	80.4	209,999	4,470.9
Rental of facilities	41,001	174.7	8.11	332.5	-157.8	23,559	41.5	3.54	83.4	-41.9	254,681	459.3
Distributing commodities:												
Within Metropolitan Denver	16,875	103.1	7.21	121.7	-18.6	13,329	46.5	3.59	47.9	-1.4	133,256	497.4
Outside Metropolitan Denver but within the State of Colorado	2,859	48.9	16.05	45.9	3.0	4,366	47.1	10.15	44.3	2.8	29,982	355.3
Total distribution within Colorado	19,734	152.0	8.49	167.6	-15.6	17,695	93.6	5.21	92.2	1.4	163,238	852.7
Outside Colorado <sup>7</sup>	15,131	...	...	...	...	3,396	...	...	...	...	46,761	...
Total distribution	34,865	152.0	8.49	167.6	-15.6	21,091	93.6	4.37	92.2	1.4	209,999	852.7
GRAND TOTAL	34,865	3,520.3	96.77	3,374.0	146.3	21,091	429.2	18.46	389.3	39.9	209,999	5,782.9
												27.06
												5,682.0
												100.9

<sup>1</sup> All costs are based on calendar year 1966. <sup>2</sup> Volume incurring cost. <sup>3</sup> Includes cost for avoidable delay to inbound trucks. <sup>4</sup> Negligible amounts. <sup>5</sup> Not shown to avoid disclosure of confidential firm data. <sup>6</sup> Does not include rental of facilities. <sup>7</sup> No attempt was made to compute cost of distribution to points outside Colorado.





